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Address.

THE DIFFERENTIAL DIAGNOSIS OF PULMONARY TUBERCULOSIS.*

By William H. Smith, M.D., Boston,

Visiting Physician to the Massachusetts General Hospital.

It is my belief that the recognition of pulmonary tuberculosis has reached a high level in this state. It is my belief that the number of cases wrongly diagnosed is infinitesimal in proportion to those in which the correct diagnosis is made. I think if those cases were excluded where carelessness permits well developed phthisis to be called grippe or malaria the real quota of mistaken diagnoses would be very small.

It is the occasional or unusual case that I wish to speak of. It is possible that I overemphasize the importance of these, but experience and interest have brought me in contact with many pulmonary conditions, tuberculous and non-tuberculous, while several thousand sputum examinations have put me in touch with infections other than those due to the tubercle bacillus.

The subject for discussion—"The Differential Diagnosis of Pulmonary Tuberculosis"—naturally divides itself into two parts:

(1) The differential diagnosis of early pulmonary tuberculosis.

(2) The differential diagnosis of late pulmonary tuberculosis.

Among the frequent manifestations of early pulmonary tuberculosis may be mentioned: (a) loss of weight; (b) hemoptysis; (c) fever; (d) debility; (e) cough. There are well recognized clinical conditions other than phthisis in which these symptoms, one or all, may appear. If mistakes are made they are usually through carelessness rather than lack of knowledge. I think there is some danger in emphasizing slight variations in apical percussion, or even in too literal interpretation of x-ray plates, without obtaining all the facts which a careful history or a more careful physical examination would furnish. I believe the expert on tuberculosis would be a better diagnostician if he saw more non-tuberculous cases.

(a) *Loss of weight* is a striking and early symptom of pulmonary tuberculosis. I would merely call attention to the fact that loss of weight greater than is usually seen in tuberculosis may be the first manifestation of the early thyroid case. Before goitre or exophthalmos appear, this loss of weight, with slight increase of the pulse rate, may suggest the possibility of phthisis. When tremor, which is present in these cases, is especially looked for, it usually will be found. Too frequently it is misinterpreted, as is the pulse rate, and considered of nervous origin, therefore phthisis is considered most likely. A most careful history of the incidence of tuberculosis in the family, a most careful questioning for any previous tuberculous infection, and a careful physical examination for evidence of old foci of tuberculosis, pleuritis, glandular tuberculosis, or tuberculosis of the genito-urinary tract, will usually add evidence for or against phthisis. Louis' law should be remembered in this connection: "After the age of puberty a tuberculous lesion in any part of the body is almost invariably accompanied by pulmonary tuberculosis."

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* Read before the Framingham Medical Club and the Community Health Station, September 20, 1917.

I saw, recently, two patients—one a doctor. Each had lost weight—one, forty-five pounds; the other fifty pounds, in a few months. The doctor was sure he had tuberculosis. In each the diagnosis of early thyroidism was made; within a few months both had developed goitre and exophthalmos. The diagnosis was suggested by the marked weight loss, the tendency to tachycardia, and the tremor. In any doubtful case the high basal metabolism present in goitre would make certain the diagnosis.

(b) *Hemoptysis.* I believe in the correctness of Cabot's dictum: "I do not deny that the causes of hemoptysis are numerous, but I assert that the causes of genuinely obscure hemoptysis in temperate climates may be reduced to one—pulmonary tuberculosis."

Too frequently patients are seen who give the history of having had hemoptysis several months before, who have been told by their physician that the blood did not come from the lungs. No adequate examination has been made of the case, no proper treatment for the underlying tuberculous condition has been instituted. When examined, advanced phthisis is only too frequently found. I believe widespread instructions upon this neglect of a very important symptom are necessary, judged by my personal experience with these neglected cases.

In the list of causes of hemoptysis in Cabot's "Differential Diagnosis" at the Massachusetts General Hospital, there were 1723 cases of phthisis, 1177 of mitral disease. I do not think this proportion fair, for limited numbers of phthisis cases are admitted to the wards of this hospital, while the cardiac cases are welcomed. The essential feature is that in mitral disease hemoptysis is common. I know of no heart condition so frequently overlooked as mitral stenosis, unless it is the early aortitis case. The reasons for this are, I believe, in the main, two: (1) Frequently the presystolic murmur or the diastolic murmur of mitral stenosis is absent at the time of examination; (2) it is heard only in an unusual position. Where a careful history has been taken, and frequent sore throats are recorded; rheumatic fever or chorea appears; where the tonsils have not been enucleated, and are still large, or merely clipped, the weight of evidence is in favor of cardiac mischief. It is not sufficient to disregard the soft systolic souffle at the apex, and explain it as hemic or due to the general condition of the patient. Cardiac hypertrophy should be most carefully looked for. The apex of the heart should be palpated with the patient in the left lateral position. Murmurs should be listened for over a wide area, with the patient in various positions. If the hemoptysis is not too recent, slight exercise should be tried to see if the murmur will develop. Deflation of the lung (panting) will oftentimes produce change in the first sound, or develop a presystolic or diastolic murmur, clearly due to mitral stenosis. Check upon the probability can be made by a seven foot x-ray plate, or cardiogram tracing.

I have known bleeding from a gastric ulcer to be mistaken for hemoptysis. This could occur only where the patient was not seen at the time of the bleeding, or through a very imperfect history of the attack.

The bleeding associated with the expulsion of a fibrinous cast, and that with the expulsion of a foreign body (a piece of chicken bone) were both thought due to tuberculosis of the lung. In one large hemorrhagic cast three tubercle bacilli were found.

(c) *Fever.* There are some patients in whom slight registration of evening fever, with chilly sensations, have led to the suspicion of phthisis. It is important to consider in this type of case foci of concealed pus. X-rays of the sinuses, of the teeth, careful questioning about recent fillings of teeth or tender teeth, should be made. Examination of the urine should be made with a view to excluding an unrecognized pyelitis, possibly even associated with a silent calculus, only to be discovered by the x-ray. Occasionally syphilis of the lung with hemoptysis, or syphilis of some internal organ, with fever, may lead to the suggestion of phthisis. A Wassermann would probably clear the diagnosis at once. Occasionally Hodgkin's disease, with fever, without palpable gland enlargement may simulate phthisis. Usually the splenic enlargement, the enlarged bronchial glands, or mesenteric glands will suggest the possibility of the condition.

(d) *Debility.* Under the term debility is usually classified a candidate for phthisis. This group comprises many of the gastroptotic, low blood pressure cases, with gastric symptoms In these thin, weak-muscled individuals, the physiological differences of the apices are exaggerated, especially when varying degrees of apical atelectasis are present. These patients require a great deal of study and much investigation before tuberculosis can be excluded. The majority of them are women; their usual age, twenty to thirty. They are usually much operated and much drugged, which adds to the confusion of the real underlying condition. Occasionally one has Addison's disease—the x-ray of the lungs will frequently show calcified glands or peri-bronchial thickening. No harm is done in treating them as if tuberculous, if over-feeding does not upset the ptosed stomach.

(e) *Cough.* Someone has said that every cough of two months' duration is due to tuberculosis. This is, of course, absurd. To determine the cause of the chronic cough may require time. To assume it at once due to phthisis discredits the examiner. The sputum examination separates often, at once, the tuberculous from the non-tuberculous case. It is surprising how difficult it is for early phthisis cases to furnish sputum. Bring them a cup, stand over them, and tell them to cough and spit into the cup. This simple method will raise at once the number of positive sputum findings. By this method I reported twenty-one positive sputum findings in one month's out-patient service. It is the atypical case, with the atypical history, in whose abundant sputum no tubercle bacilli have ever been found, that is so frequently puzzling. Physical examination usually helps to clear up the diagnosis in those cases where cough is the chief symptom. The age of the patient suggests other possible causes than phthisis. X-ray examination of the mediastinum or lungs, for glands, aneurysm, foreign body, high diaphragm, eliminates many possible factors, while Wassermann reactions and bacteriological sputum examinations assist in the diagnosis.

Occasionally, errors in diagnosis occur when pain in the chest suggests pleurisy; pleurisy, tuberculosis; and tuberculosis, phthisis. Two patients with the diagnosis of pleurisy were found to have mastodynia. One had syphilitic periostitis of a rib; one, referred pain from spinal osteo-arthritis. Metastatc pleural involvement from adeno-carcinoma was proven in one case by excision of a small gland just under the outer border of the pectoralis major muscle, and hypernephroma with lung metastasis, by x-ray of the kidney.

The acute broncho-pneumonia of influenzal origin, where the focus is situated at an apex, offers an interesting field for differentiation from early phthisis. The association of sinus infection is common in influenzal cases. X-rays of these are frequently of value. Tuberculosis of sinuses is rare. The finding of an extensive involvement of the naso-pharnygeal tract in a suspected case is against phthisis, but favors some other infection, like influenza. The history and further examination will make the diagnosis clear. In other words, to the careful man who employs modern methods of diagnosis, the differential diagnosis of early pulmonary tuberculosis offers little difficulty. I have often thought it would be of value to have a show-down of the evidence upon which some of the diagnoses of phthisis are made. I have encountered sufficient error in my experience to make me question if at times too much was not taken for granted in making such a simple diagnosis. It is carelessness, not ignorance, which renders differential diagnosis of early pulmonary tuberculosis difficult, if it is difficult. The essential factor to remember is: the safety of the patient and the community is of much more importance than is the diagnosis. While this is being cared for by the provisional diagnosis of phthisis, further evidence may be accumulated for or against phthisis. It is when this evidence is not sought for, or the patient not treated as if phthisis was present, that the mistake is made.

When we come to consider the differential diagnosis of late pulmonary tuberculosis, the problem is more complicated. In my experience any acute inflammatory condition of the lung, if it is obscure, or unrecognized, may, if it goes on to pus formation, either by retention or compression, at times by extension, produce a condition simulating late phthisis. Pressure by aneurysm or new growth upon bronchi, with a resultant bronchorrhea, and fever, may suggest late phthisis. New growths, either by their pleural involvement, or when necrotic or secondarily infected, may mislead. Foreign body or embolic lung abscess is difficult of differentiation. Primary suppurative foci beneath the diaphragm, like the appendicular liver or perinephritic abscess, may, by their secondary pleura or lung involvement, suggest pulmonary tuberculosis.

How many specialists of tuberculosis, when called upon to diagnose an obscure lung condition following an appendix operation, question whether any focus of pus was present around the appendix at operation? With this fact known, the probability or improbability of a primary or secondary lung condition at once appears. Again, it is difficult to explain an obscure lung condition when in one interspace serous fluid is obtained, and 1 cm. lower, chocolate colored pus is drawn off, unless the history of operation for ureteral stone three months before is ascertained, and the fact that there was some pyelitis following operation. With these facts, perinephric abscess, sub-diaphragmatic abscess, secondary pleural irritation with lung compression, becomes apparent.

Fever, cough, loss of flesh, purulent sputum of months' duration led, with the physical signs to the diagnosis of tuberculosis, although no tubercle bacilli were found in the sputum. The history of the case favored septic embolism with pulmonary abscess and secondary lung involvement. Operation showed this to be correct. The history in brief was as follows:

A woman operated for fixation of uterus—infected wound. A few days later sudden left axillary pain waking her from sleep; a few days later pleuritic pain, fever, then cough and purulent sputum. Sputum negative for tubercle bacilli—large numbers of streptococci, extra and intracellular. Primary streptococcus lung involvement is rare. It is usually secondary to embolism or part of a general streptococcus process or infection from inhalation. The presence of hematoidin crystals in the sputum was consistent with broken-down blood clot; consistent with embolic infarction.

In one lung, at autopsy, when a suppurating mediastinal lymphoma had produced pressure on the left lung, was found pleurisy with effusion, pressure atelectasis, bronchial compression with dilated bronchi, bronchorrhea, infarction, and pulmonary vein thrombosis. Imagine relying upon the changing daily physical signs in such a case! Yet there was cough, purulent sputum, fever, sweats; the patient was a young adult. The only positive aid in diagnosis was plate No. 2, x-ray, out of ten plates taken. This early plate was more suggestive of malignant lymphoma or mediastinal tumor. With the progress of the pathological lesions, due to compression, all other interpretations of the x-ray plates were unsatisfactory. Aneurysm was excluded by seven foot x-ray plate; absence of Wassermann reaction; absence of aortitis; the esophagus, when filled with barium and x-rayed, was found to be dislocated. Against tuberculosis surely!

I believe certain chronic influenzal bronchiectatic cases are wrongly diagnosed phthisis. As the condition is incurable the harm is not great, as the method of treatment applied for these supposed phthisis cases is in the main beneficial. The differential diagnosis is difficult, and time consuming. It can be done, however.

I think the differential diagnosis in elderly people between chronic bronchitis and emphysema and extensive phthisis is important. Under the emphysema the physical signs of phthisis are masked, and as they frequently show no fever and no increase of pulse rate, they are treated for bronchitis. Examination of the sputum for tubercle bacilli in this group of cases would yield some interesting results. I believe they are a source of danger because unrecognized.

The occasional foudroyant phthisis, simulating lobar pneumonia, can easily be recognized if the sputum is examined for tubercle bacilli. Fortunately this form of tuberculosis is rare, and the patients are bed-ridden from the start, and die before much chance for contact infection has occurred.

I have personally seen simulate late pulmonary tuberculosis, syphilis, influenza, bronchiectasis, multiple influenza broncho-pneumonia, foreign body bronchiectasis, foreign body inhalation pneumonia with abscess, after tonsillectomy or following teeth extraction under ether, encysted empyema, subdiaphragmatic abscess, actinomycosis, malignant suppurating lymphoma, malignant disease of the lung, aneurysmal phthisis. In other words, any of the acute infections, given time enough, may through their chronicity simulate, identically, late tuberculosis. The history of the original onset of the condition, with a knowledge of pathology and bacteriology, is as important in the differentiation of these cases as are the physical signs. In other words, I believe it difficult, outside of a big institution where every means of diagnosis can be applied, to differentiate some of these cases, and then only after much work has been done on the case. These cases in which no tubercle bacilli have been found with suggestive evidence against tuberculosis, should, in my opinion, have the benefit of investigation at one of the large hospitals. No consultant can diagnose the case seeing it but once. It is only when evidence has been accumulated that the diagnosis will appear. This takes time and labor.

My own practice in these chronic pulmonary conditions simulating phthisis is as follows: First, a most careful history, not only of the family but of the social conditions, of the working conditions, with the possibility of infection at home or at work; whether the patient has recently moved into another house, or has travelled much; the onset of the pulmonary condition; whether it started as a nasopharyngitis with fever, acutely, or followed an infection suggesting pneumococcus pneumonia; whether there had been any recent operations; if so, what they were, the anesthetic used, whether badly taken, the condition found at operation; the convalescence, if complicated. Next, the amount of sputum raised is carefully inquired into, its character, purulent, with or without hemoptysis, odor, ease with which it is raised. Cough; its character, dependent upon position, increased by change of position, productive or non-productive, periodic or constant, with or without heart symptoms. The sputum is then examined daily for tubercle bacilli, while the patient is under observation. If no tubercle bacilli are found, the type of prevailing organism present is noted—extra or intracellular, presence or absence of hematoidin crystals. In my experience in all chronic bronchiectatic cases the influenza bacilli will be found if careful search is made, frequently, of course, mixed with pneumococci and diphtheroids. Desquamated cells from the bronchi will usually be found. If hemoptysis occurs, frequently the sputum in the next few days will show large numbers of influenza bacilli. They may be isolated in pure culture on hemoglobin agar. Slides are made, and stained by Gram-eosine, and looked over with the low power for branching filamentous threads, Gram-staining. Elastic fibres are searched for. Presence or absence of large numbers of eosinophile cells is noted. Charcot-Leyden crystals are looked for in the sputum. Occasionally asthma simulates phthisis. Usually some clue as to the probable infection may be obtained by this searching sputum examination.

Four-hour charts are started on all patients at admission. X-rays of the chest are taken;

later, if necessary, stereoscopic. In one case an aluminum tracheotomy tube, blocking the left bronchus, with bronchorrhea, fever, chills, sweating, extensive left lung signs, failed to show in x-ray plates especially taken to exclude foreign body. Wassermann reactions are the rule on all cases in the ward.

If effusion is present, tapping, with bacteriological and cultural examination, is done, with cell count. Smears of all fluids are stained by Gram and eosine. Frequently dead pneumococci will show in the smear when they do not grow out in the culture.

If there is any suggestion of new growth, either in the history or physical examination, the primary tumor is sought for. X-rays of stomach and intestine, bismuth enemata, uterine examinations, x-rays of kidney for hypernephroma, commonly metastasizing in the lung or pleura, even x-rays of the distended kidney pelvis where the suggestion is warranted after a genito-urinary consultation. Any accessible gland along the outer border of the pectoralis major muscle, or if accessible in the axilla, or even above the clavicle, is excised and sent to the pathologist. Blood examinations with differentiation are done as a routine to exclude hidden suppurations or leukemia. In rare cases, after consultation with an expert in the use of tuberculin, tuberculin tests may be made. Daily amounts of sputum are measured in the ward; the larger the amount the more apt is bronchiectasis or undrained abscess or empyema, encysted, to be found. Clubbing of the fingers and toes is noted. Aneurysm is excluded by the absence of aortitis. I have had no bronchoscopic examinations made.

In doubtful cases exploratory thoracotomy is advised, after carefully going over the case with the special surgeon; each detail in the presumptive diagnosis being given; whether the focus is below the diaphragm or above; whether secondary to embolism or pressure; the evidence against tuberculosis is presented with the evidence for the probable condition; the pre-operative risk of the patient is carefully gone into by the medical service.

A surgeon has been following the past two weeks a case. The examination of the pleural fluid has been done on five separate fluids, daily tubercle examinations of the sputum have been made, repeated x-ray plates have been taken—kidney plates as well as lung plates. Whether a small sub-diaphragmatic abscess has secondarily infected the pleura, or a small lung focus, possibly tubercular, is the cause of the suggestive purulent pleuritis, has not been determined to date.

CONCLUSIONS.

I do not think the differential diagnosis in early phthisis offers much difficulty if care is used. If there is any doubt, the patient should be treated as if tuberculous; the possibility of thyroidism, of mitral disease, concealed pus, ptotic conditions, should be thought of in the doubtful case. A careful history or further examinations will clear up the diagnosis. In the meanwhile the patient is being treated as if phthisis was present.

In the late cases I do not believe, when the doubt of phthisis has been raised, that it is possible, without being prepared to follow out the methods of diagnosis suggested, to differentiate between late phthisis and other lung conditions. I believe these patients should be referred to one of the large hospitals, where, at small expense, the necessary examinations can be made. Without them I, personally, do not know how to differentiate these atypical lung conditions simulating late tuberculosis.

Society Report.

NEW ENGLAND PEDIATRIC SOCIETY.

MEETING of Society held at the Boston Medical Library on April 27, 1917, at 8.15 p.m.

Dr. Maynard Ladd of Boston in chair.

The following papers were read:

1. "Treatment of Eczema," Charles J. White, M. D., Boston.
2. "Mechanisms of Defense and Serum Treatment of Poliomyelitis," Harold L. Amoss, M.D., New York.

Discussion opened by Dr. Francis W. Peabody, Boston, Dr. Edwin H. Place, Boston.

Light refreshments were served after the meeting.

THE TREATMENT OF ECZEMA IN CHILDHOOD.

BY CHARLES J. WHITE, M.D., BOSTON,
Edward Wigglesworth Professor of Dermatology in Harvard University.

THE eczema of childhood has always been one of the dermatologist's difficult problems, but, within a few years, since the introduction of fecal examinations and cutaneous food tests, the pediatrists have been assuming more and more of this etiologic and therapeutic burden; to such an extent, in fact, that some of them have appeared in print with the startling assertion that henceforth eczema should be considered the pediatrists' province, validating this claim on the grounds that the treatment of eczema is purely a question of feeding. We dermatologists who have dealt with this problem for so many years do not hesitate to dispute this claim vigorously; first, because we know from our experience in public and private practice that many pediatrists are not yet capable of making a proper diagnosis of the complex disease, eczema; and secondly, because we are not yet convinced that all examples of the conditions now classified under the heading of eczema have been proved to be dependent on food poisoning, so to speak.

This is seemingly, perhaps, a peculiarly ungrateful introduction to this paper, the investigations for which have been based on the pioneer work done by one of your members, Dr. Talbot, who, in 1913, in conjunction with Dr. Towle, published an article on the stools of eczematous babies. Nevertheless, I must stick to my guns for the reasons aforesaid.

Following the lead thus described, I have devoted practically all of my medical leisure during the last three years to the etiological question of eczema from the standpoint of food. Cutaneous food tests and stool examinations have been made, and my records of children and adults extend now to above three hundred. Let me hasten at once to state that the cutaneous tests have been made largely by my house officers, and the fecal examinations by Dr. F. B. Talbot, Dr. L. W. Hill, and by my house officers as well. To all of these valuable coöperators I now extend my sincere thanks.

The results which follow later on in this communication relate to chronic eczema—that mysterious cutaneous eruption the cause of which has thus far escaped detection, and the rapid cure of which still awaits further solution. You will see, therefore, that I do not include in this category the cases of acute eczematous dermatitis (dermatitis venenata), the origin of which we know, or the examples of more or less long-continued eczematous dermatitis which yield promptly to expert external treatment. The type of eczema to which these experiments relate is represented by those cases which may begin within a few days or weeks of birth without ascertainable reason and persist, despite the best of care, for one or more years and in some instances off and on until the death of the individual in old age.

Before we take up this more difficult subject, let me dismiss the easy part of this problem of eczema, that is, the treatment of the amenable cases.

ECZEMA AMENABLE TO EXTERNAL TREATMENT.

General Directions. Let us bear in mind always that eczema is an inflammation, and like all inflammations, demands rest and protection from harm; and in this specific instance protection from harm means guarding the skin from all physical and chemical irritants, including water. If we are dealing with an individual who must continue his daily task and who, therefore, must of necessity wash, let us appreciate that this necessarily frequent evil can be mitigated somewhat by adding cornstarch or bran to the water, by regulating the heat of the water to that of the external body temperature, by using a superfatted-coldcream soap, and by drying the skin as one would blot ink with blotting paper. Let us warn our patient to protect his affected hands with frequently sterilized gloves. Let him use cotton gloves for light dry work, dogskin gloves for heavy dry work, and loose-fitting rubber gloves, well and constantly powdered, for wet work.

Of course these directions are intended for the individual who must continue his work, but it goes without saying that such an individual will be cured comparatively slowly and that he certainly increases the risk of becoming what I have termed an unamenable case.

Intertrigo. The erythematous condition which occurs on contiguous surfaces as a result of heat plus stationary urine, feces, or perspiration is very easily managed by sufficient and gentle bathing with a mild soap and lukewarm water; by thoroughly drying, by patting rather than by wiping, with a sterile absorbent material; by dusting into the folds of the skin a well-made, borated talcum powder; by changing clothes the moment they are soiled; and, finally, by forbidding too many and too warm clothes. The overdressing of young children is happily passing in this modern era of underdressing in adults, except among the poorer classes, where we still see babies swathed in yards and yards of unnecessary and dirty clothes.

Miliaria. Prickly heat, although perhaps not strictly speaking an eczema, should be included here. Once more we are dealing with too great heat, either artificial or natural, and it behooves us to correct the former cause. Cut down the amount of clothing to the limit; favor rest during the heat of the day; limit the amount of heavy foods ingested; request frequent baths in cool water; and have ready at hand the well-known milky wash (acid carbol. 2, zinc. oxid. 16, aq. calcis 250); sop this on the moment the skin itches or prickles, and as soon as it dries dust on plenty of borated talcum powder.

Balanitis. This peculiar eczematous infection of the glans penis looks and is terrifying to the young boy, but it is, happily, a condition curiously amenable to the right treatment. If the physician is cognizant of black wash (hydrarg. chlorid. mitis 2, aq. calcis 250) and uses it in the correct way, balanitis melts away like magic. The cure of this disease can be hastened by the additional use of boric acid ointment, worn when the wash is not being applied. If balanitis becomes a recurrent trouble the child should be circumcised.

It is proper to pause here to interpolate a few remarks based upon a rather long experience with patients who have been treated by medical men who have not made a specialty of dermatology. The seemingly inevitable tendency of this large proportion of the profession is to use too strong applications, to employ advertised remedies, or to prescribe the proper remedies and fail to impress on the patient their proper use. This last shortcoming is especially evident in the treatment of moist dermatoses where we dermatologists are apt to suggest evaporating lotions and dusting powders and perhaps no dressings;

while the general practitioner may prescribe ointments and bandages; and the surgically inclined may wrap the part up in yards of dressings and in some cases even apply oiled silk.

Let me repeat that the most serviceable proportions in ingredients in the very useful "white" wash and "black" wash are those which have been detailed above, and that the white wash should be reasonably fresh and sopped on at frequent intervals (in vesicular or bullous conditions as often as once an hour) and that the black wash should be laid on the affected part by means of a thin piece of linen or cotton for fifteen minutes twice or three times a day. These are the best methods for the use of these two valuable and serviceable lotions, and yet I have frequently seen them both used as poultices and have had the attendant physician describe their effect as useless. A large part of the success of dermatological practice depends upon the knowledge of detail of the physician and upon the implicit coöperation of the patient.

Paronychia. Here again is an eczema-like infection which may well be mentioned in this connection. The treatment of this at times painful condition is really that of balanitis and it is surprising to note the ready response of this apparently deep infection to the proper application of black wash plus boric acid ointment (acid. boracic. 2-4, adipis benzoat. 30) under a thin "cot," with or without the addition of salicylic acid, plus the absolute cessation of all manual work with the affected finger, and the forbidding of contact with all substances save those described.

Eczema Impetiginosum. Once more we are dealing with a condition which in a true sense may not be eczema at all but a condition which cannot objectively be differentiated from that elusive quantity known as eczema. The instinct of the trained man in these cases is to look at once for the presence of pediculi or their ova. If any of these foreign bodies are detected, the simplest remedy in boys or in young girls is to cut the hair short, thus getting rid at one fell swoop of the whole etiological question. In older girls and in all children in the winter months this radical procedure is not practicable and we must resort to the tedious application of crude petroleum (because this substance is efficient, cheap and easily obtained) to kill the living organisms, and to the still more vexatious process of ungluing the nits from their firm attachments to the hair shafts. This is a very troublesome question, for the keratin of the egg shells and of the human hair is very closely allied chemically, and it follows that what destroys the one will probably destroy the other. We must, therefore, limit our efforts to loosening the ova from their seats. Thus far chemists have not produced, or at least dermatologists have not discovered, the ideal solvent. At present we believe that xylene—a distillate of wood—is our best agent; but we must remember that this substance is somewhat irritating to the young skin, and we must actively bear in mind that it is highly inflammable. The application of xylene should, in consequence, be left to trained hands.

With the rapid or the gradual riddance of pediculosis from the hair, we begin simultaneously our attack on the cutaneous eruption. Here our methods are well defined. We must remember that staphylococci, or perhaps streptococci are at work, and we must advocate frequent gentle shampoos with soap and water; but here, also, precautions must be taken. We are dealing with a superficial infection and we must take care to limit this infection. Let us, therefore, recommend sterile gauze as a sponge and as a towel, and let us make use of a mild, powdered or liquid soap, rather than the family cake. With the areas properly washed and dried, we then apply boracic ointment (2 to 30) and within a few days we expect to see the process dry up and begin to disappear.

Eczema Madidans. This form of eczema represents the type that we encounter most frequently in childhood. It may begin within a few days or weeks of birth, and, if untreated or handled improperly, may lead to the variety of the disease we all dread—the type which I have earlier this evening designated "unamenable." Up to within a few years even skilled dermatologists feared this type of infantile eczema, for we knew that most of these cases would defy our best and most painstaking treatment. We still recall the first two winters and the intervening summer of these children's lives, the impossibility of their bathing, the scratching and tearing of their skin, the writhing of their heads and bodies, their necessary confinement under masks and safety-pins, the boxing gloves for their hands, the stiff cardboard for their elbows, their necessary confinement to the house in the cold months of the year, their inability to dig in the summer—all in all a hideous nightmare to us all, patients, parents and doctors alike.

Now, fortunately, this prolonged and distressing experience is for the most part banished from our lives, for we have discovered a remedy which has revolutionized this part of our practice, and the large majority of these children are cured, and cured within a comparatively few weeks. This remedy lies in the proper use of crude coal tar, the by-product of the manufacture of coal gas. This is an inky black, thick, barely fluid mass which smells somewhat of gas. It is essentially a crude substance, varying, of course, with the type of coal from which it is derived. I have used it in great quantities in public and private practice, and in properly selected cases its effect is really wonderful. It is, indeed, no exaggeration to state that its use has entirely altered the treatment of moist eczemas in its various types. Strangely enough, there is practically no reverse to this brilliant picture—in other words, save for an epidemic of three cases, I have never known this drug to do any harm in my hands.

Brocq of Paris was the probable discoverer of the therapeutic value of this substance, and he advocated its use in pure strength in the weeping, localized eczemas of adult life. We have extended its uses by modifying its manner of application, until now we prescribe it wherever we can possibly find any excuse—that is, in any eczema which shows any sign of moisture. Experimentation has proved that in its pure state it is advantageously used only on the raw surfaces of the adult disease; in childhood we prescribe it in the strength of one-half drachm to the ounce of zinc paste (crude coal tar 2, zinc. oxid. 2, amyl. maidis 16, vaseline 16). This still black mass is smeared thickly on the face or scalp or hands night and morning by means of a wooden throat stick, and no dressing whatever is placed over it. Every day the old paste is removed gently with the aid of soft gauze and oil of sweet almonds, and the fresh applications are made until the disease is cured or until we find we are dealing with an unamenable example of the disease.

There are three minor drawbacks to this otherwise almost perfect medicament: 1. It is very dirty and of course stains badly. Linen or cotton should never be washed with soap or water without first rubbing the soiled fabric well with lard—otherwise an indelible battleship-gray results. 2. Where there is hair, the crude coal tar is likely to produce follicular pustules. Therefore—and this rule is particularly pertinent when vernix caseosa is present—cut all hairs as closely as possible and as frequently as necessary before applying the drug. If pustules develop, cease all applications in their immediate vicinity until these intercurrent lesions have disappeared. 3. Crude coal tar will not tolerate, that is, in my hands, the synchronous use of any other drug. In other words, don't try to use another and more esthetic application by day; use nothing at all, or, best of all, continue the application of the crude coal tar day and night until the disease is wholly well, or until you find that it cannot get well by this means. You would treat a broken leg or a severe systemic disease throughout the twenty-four hours, surely, and, therefore, try to convince your frequently recalcitrant patient that eczema requires all the care it can get. You are handicapping severely your patient and yourself if you don't exhibit a little backbone in such circumstances.

These three are the only difficulties in the use of this otherwise splendid drug—a drug which has meant much to my patients and to my peace of mind and satisfaction in the last few years.

Eczema Papulosum. This is an infrequent type of the disease, and especially uncommon in children. If confronted with this variety of the process, don't use ointments or pastes. Prescribe washes, and, if successful, be careful not to stop half way in the course and add or substitute any greasy substances. A very good wash for the acute cases is as follows: amyl. maidis 25, talci 25, glycerin. 20, aq. saturnin. 100, aq. destillat. 100; and for the chronic examples: liq. carbonis detergent. 20-30, aq. destillat. 250.

Eczema Squamosum. For the dry, finely scaling type of the disease, mild ointments do very well. Remember the rôle that cold, dry weather or hot, dry weather plays in this form of the trouble. Remember, also, that eating corn off the cob is a not infrequent cause of dry perioral eczema. A very useful ointment is the following: acid. salicyl. .65, bismuth. subnitrat. 2-4, ung. aq. rosae 30.

These, then, are usually successful remedies to apply when we are confronted with amenable eczema in one or more of its many various phases. If we are to succeed in our efforts we shall know it within a week or two. If we find that we are to fail, then we must make up our minds that we must call to our aid other methods than the simple applications of external remedies.

ECZEMA NOT AMENABLE TO EXTERNAL TREATMENT.

So far as I can judge there are no outward differences between individual examples of eczema amenable to expert external care and those which are to prove unamenable. Even in cases which have lasted for years the proper applications may prove curative in a comparatively short time; but of course the longer any dermatosis has continued the poorer the prognosis—that is usually a safe guess.

During the last few years it has been my custom, as stated above, when confronted with an unamenable example of eczema of any type, to have food tests and stool examinations made, and in the long lists which follow, the inquisitive and faithful reader will note the results of these inquiries.

As all of you may not be familiar with this work, allow me to mention briefly the technic adopted in the skin tests. In a certain number of patients the skin was delicately broken by the rotation of a dental burr, while in others an exceedingly superficial incision was made with a clean, sharp scalpel. The latter method was finally adopted because it produced less artificial disturbance in the controls of the factitiously urticarial subjects. The flexor surface of the arms of the affected subject was cleaned, two parallel rows of four or more incisions were made, and into the incisions of one row were gently rubbed the particles of food to be tested, while the others were left undisturbed and served as controls. The arm was observed at intervals up to a half hour, and a slightly positive reaction was considered to consist of reddening and infiltration; a positive reaction of definite papulation and a double positive was recorded when these characteristics were still further accentuated.

During my first and second years only raw food types were inoculated. Milk freed from its fat content was chosen to represent the most important food of childhood, salt-free butter to represent fats, egg albumin to represent proteids, and lactose or oatmeal water to represent the sugars and starches. As experience grew, it was learned that an individual might be susceptible to only one or to more of a certain group of our food substances, and so the tests were extended to many individual representative foods. For this work one of two methods was adopted—either the so-claimed proteids of foods, as dispensed by a certain chemical company, were used, or the articles of food were prepared according to the formulae adopted by Dr. J. A. Turnbull.

By one of these latter methods we have tested many individuals with the following substances: beans, wheat, barley, rice, oats, rye, lentil, corn, buckwheat, pea, turnip, cabbage, carrot, tomato, squash, potato, parsnip, grapefruit, strawberry, egg white, lactalbumen, beef, lamb, pork, and chicken.

The professionally prepared "proteins" have been given a thorough trial, and in a later series were compared in the same individual with the raw product method, but the conviction was finally borne in upon me that they are not reliable. My own trials of foodstuffs, prepared according to Dr. Turnbull's methods, are not sufficiently numerous to be of any value, but it is evident that he and Dr. Goodale and other investigators have faith in them, at least in urticaria and asthma and hay fever.

For those who are interested in this modern theory of eczema I have introduced the method of food preparation for the cutaneous tests adopted by Dr. J. A. Turnbull and the procedures in stool examination followed by Dr. L. W. Hill.

PREPARATION OF FOODS AS TESTING MATERIAL.

1. Render food to a fine mass, add water and allow to stand in a cool place for two days.
2. Filter and to the watery extract add four volumes of 95% absolute alcohol. The alcohol throws down a precipitate.
3. Filter and wash the precipitate: (1) with normal saline solution, (2) with 95% alcohol twice, (3) with ether twice, and (4) allow to dry in a powdered form.

This is the method adopted by Dr. J. A. Turnbull, who is devoting much time to the subject of food tests in urticaria, asthma and hay fever.

FOOD TESTS.

Case 1. Male, aet. 4½ years. Disease present since birth. Treated for four years. Eruption consists of oozing redness of face and scalp, at times impetiginous. Von Pirquet negative. Food tests negative.

Case 2. Male, aet. 8 weeks. Child breast fed. Has an occasional green stool. Scalp shows a large cradle cap, and for five weeks there has been a redness and scaling of forehead and side of scalp. Tests: albumin ++, butter +.

Case 3. Male, aet. 7 months. White cell count 20,000; eosinophiles 1%. Stools are yellow and sour and show many large, coarse, white curds. Infant breast fed for two months and afterwards according to milk formulae. Disease present for six months. The scalp, forehead and cheeks are moist, red and crusting. With the use of crude coal tar and suitable changes in the milk formulae, disease was cured in twenty-five days. Tests: milk ±, albumin +++.

Case 4. Female, aet. 8 years. Leucocytes 6,000-11,000, hemoglobin 75-90%, eosinophiles 2-3%. Stool shows some fat but not in excess. Disease present for two years. Eruption was finely papular for weeks and later became erythematous and impetiginous, affecting scalp, face, hands, arms, neck and upper thorax, and accompanied by marked adenitis. Rebellious to many forms of treatment, including the use of x-rays and auto-serum. Aggravated by a non-nitrogenous diet, and somewhat benefited by a low fat régime. Tests: milk +, albumin +.

Case 5. Female, aet. 16 months. Whole lower face a mass of moist crusts. Tests: milk ±, butter ±, lactose +.

Case 6. Male, aet. 11 months. Child breast fed. Disease evident for ten months. Forehead, cheeks, chin and wrists red and furfuraceous. Tests: milk ±, albumin +.

Case 7. Male, aet. 3 years. The disease has been present on and off for two years and now the cheeks are pink and scaling and the trunk and back of the thighs show grouped crusting papules. Tests: milk+, albumin ±.

Case 8. Female, aet. 6 years. Disease has been present ever since birth, but child has not been treated. The hair is like tow and the skin of the face and of the bend of the elbows is infiltrated and excoriated. Tests: butter ±.

Case 9. Male, aet. 4 months. There are scattered macules on the trunk, and the skin of the palms, flexor surface of the arms, lower abdomen, penis, scrotum and thighs is bright red and moist. Tests: milk ±.

Case 10. Female, aet. 6 months. At age of one month the whole body was affected. Child entirely breast fed. Now the skin behind the ears and in the folds of the neck is red and moist. Tests: milk ±, albumin ±, butter ±, control of albumin ±.

Case 11. Male, aet. 4 months. The baby is breast fed and has bottled milk as well. For two months the eruption has been present, and consists of an extensive cradle cap and redness, scaling, and, at times, moisture behind the ears and on the left cheek. Tests: milk +, albumin ±.

Case 12. Male, aet. 2 years. Since early life the skin has been "broken out." The child was nursed only ten days. Eruption comes and goes; better in summer. There is much itching and the face, hands and arms show erythema, excoriations and bloody crusts. Tests: milk±, butter ±.

Case 13. Female, aet. 3½ months. Breast fed and constipated. The face, forehead and scalp are red and vesicular; the scalp is greasy as well. Tests: milk +++, albumin ++, butter +++.

Case 14. Male, aet. 14 years. Duration three years, and the disease is always worse in cold weather. The face and arms are thickened, lichenified, excoriated and crusted, and there are excoriations over the rest of the body. Tests negative.

Case 15. Female, aet. 14 years. The disease has lasted for one year, and now consists of a leathery, yellow-red, excoriated condition of the face and hands. Tests: milk ±, albumin ±, butter ±.

Case 16. Female, aet. 14 years. The disease appeared at the age of three months and has persisted intermittently ever since. Today the flexures of the elbows and knees, the forehead and the neck are pink, infiltrated and dry. Tests: milk +, albumin ++, butter ±.

Case 17. Female, aet. 11 years. On the left arm there are three pink-red eczematous patches three-quarters of an inch in diameter, and the patient states that she has shown the same condition for the last few winters. Tests: milk +, albumin ±, control of albumin ±.

Case 18. Female, aet. 10 years. Leucocyte count, 10,000, hemoglobin 75%. Eczema has existed for three years, principally on the face and genitalia. The child is poorly nourished. While under observation in the skin ward, on several occasions last autumn, the disease manifested itself primarily on the scalp, in the eyebrows and on the neck in the form of redness and adherent crusting. There was discharge from the ears and nose, eventuating in an attack of erysipelas. This patient was benefited more by autogenous vaccines than by any other form of treatment. Tests: milk +, butter +, lactose +. The child would be discharged free from eruption, but would return in a few weeks as bad as ever.

Case 19. Female, aet. 2 years. Leucocyte count 10,000, hemoglobin 75%. The child was breast fed for four months and then given cow's milk and eggs. At the age of two months a lesion appeared on one heel and eczema developed and has persisted ever since. The scalp is crusting and caked; the face and ears are red, oozing and bleeding; the eyelids are stiff; the back is red and stiff; the chest and abdomen are rough and papular and excoriated; the thighs and groins are red and infiltrated; the popliteal spaces are reddened. The feces showed a moderate excess of fatty acids and soaps. The child was put on a fat-free diet and treated externally, and in less than three weeks all areas, save the scalp, were healed. This region required six additional weeks to be cured. Tests: egg albumin +.

Case 20. Male, aet. 3 years. Eczema for one year, and there are now oozing lesions on scalp, abdomen and genitals, with some papules on trunk. The feces show an excess of fat. White count has varied from 10,000 to 37,000. Hemoglobin 75-80%. The eyes are prominent, the tonsils are enlarged, and there is a general adenitis. Percussion and radiograph reveal an enlarged thymus gland. Two x-ray exposures of 30 milliampere minutes, 70,000 volts, with aluminum filter, produced a decided subsidence of the thymus and of the leucocytes. Tests: albumin +, fat +, lactose +.

Case 21. Male child. Disease off and on for four years. The stool examination was negative. Tests: milk +. The patient was deprived of milk in all its food, and in one month the eczema was apparently cured.

Case 22. L. W., aet. 14, schoolboy. Duration of disease, three years. Thickening, lichenification and excoration of body generally. Food tests negative Jan. 21, 1915, and again Nov. 2, 1915.

Case 23. W. F., aet. 13, schoolboy. Treated off and on for eleven years. Present eruption consists of small pinhead papules with punctate excoriations. Chest, axillae, abdomen and groins affected. Food tests negative.

Case 24. J. B., aet. 6, schoolboy. Disease six years in duration. The pubes and adjacent thighs are red, papular and thickened; the flexures of forearms are red, fissured and oozing. Food tests negative.

Case 25. B. E. G., aet. 7, schoolgirl. Both ears are red and oozing. Food tests negative.

Case 26. R. S., aet. 2 months—a boy with nummular areas of erythema, infiltration and scales over the head, trunk and limbs of four months' duration. Food tests negative.

Case 27. B. S., aet. 1 year; a breast-fed and very fat girl who has had the disease practically since birth. The Children's Department suggests that some internal secretion is upset. The cheeks and chin show fine, pink papules and the groins are red and moist. Food tests negative.

Case 28. W. H., aet. 15 months. The disease began at the age of six weeks and has persisted. There has been much oozing and crusting on scalp, face and arms. Food tests negative.

Case 29. G. E., aet. 7 months. The eruption began six months previously, and at the time of the tests there were papules on the buttocks. Food tests negative.

Case 30. H. J. W., aet. 4 months. There are patches of infiltration, exudation and crusting on the cheeks and extensor surfaces of the arms of several weeks' duration. Food tests negative.

Case 31. J. G., aet. 6 months, breast-fed girl. Duration of disease, three months. The face is erythematous, oozing, crusting and fissured. Food tests negative.

Case 32. B. C., aet. 15, schoolgirl. Disease has been intermittently present for ten years. Present attack is three months old and consists of redness and fine vesiculation with some crusting on the palmar surfaces of the right finger. Food tests negative.

Case 33. G. H., aet. 1 year. Disease present almost since birth. Now behind and under the ear is an erythematous, moist, sharply defined area. Food tests negative.

Case 34. S. F., aet. 3 months. Duration, one month. Generalized erythema and mild exudation. The baby is breast fed. Food tests negative.

Case 35. S. R., aet. 13 weeks. Breast fed. For two weeks the cheeks and forehead have shown minute papulation and furfuration. Food tests negative.

Case 36. D. B., aet. 4 months. Disease present for three months, and at present shows a mildly exudative condition of the face and neck. Food tests negative.

Case 37. T. G., aet. 7 months. Dirty yellow crusts on both cheeks for the last two weeks. Food tests negative.

Case 38. J. J. W., schoolboy, aet. 9. Child painted himself red and the eruption appeared and has persisted. Whole face and arms are covered with an almost coalescent, excoriated, papular eruption. Food tests negative.

Case 39. J. R., aet. 1 year. Breast fed. Face and ears have been red, excoriated and exuding for one month. Second attack. Food tests negative.

Case 40. M. G., aet. 11, schoolgirl. Eczema "for years." The skin at present is generally red, thickened and fissured. Face erythematous and scaling. Food tests negative.

Case 41. J. T., aet. 20 months. Duration three months. There are crusts and fissures on the face and scalp. Food tests negative.

Case 42. H. S., aet. 3 months. Six months' duration. The forehead and cheeks are oozing and crusting. Food tests negative.

Case 43. E. B., aet. 6 weeks. Breast fed and vomits after feedings. For two weeks there have been miliary papules over both cheeks and on scalp. Food tests negative.

Case 44. M. G., aet. 9 weeks. Breast fed. The cheeks are finely papular. Food tests positive.

Case 45. J. F. K., aet. 4. The eruption appeared one week after birth and now appears as fine, bright red papules on the scalp, neck, chest and buttocks. Food tests positive.

Case 46. E. M., aet. 6 months. For four months the cheeks and scalp have shown deep excoriations and bloody crusts. Two months later the scalp was well and the cheeks dry, pink and scaling. Food tests positive.

Case 47. F. T., aet. 6. Disease has persisted six months, and at present the skin of eyelids, ears and scalp is infiltrated, crusting and excoriated. Food tests positive.

Case 48. I. R., aet. 3½ months. The first child had eczema also. The patient is breast fed, and for two months the cheeks, forehead and anterior part of the scalp have shown scattered, coalescent papules, some of which are excoriated and oozing. Food tests positive.

Case 49. T. K., aet. 7, schoolboy. Duration, three weeks. A prurigo-like eczema. Food tests positive.

Case 50. F. L., aet. 10 months, and bottle fed for last four months. Following an earache of one week without any applications, the skin around the left ear and of the cheek broke out into papules and masses of redness and crusting. Food tests positive.

Case 51. M. C. S., aet. 12, schoolgirl. The skin is generally dry and harsh; the scalp is dry and finely scaling, and there are pinhead papules generally over the whole body. Food tests positive.

Case 52. I. S., aet. 8 months. Bottle fed. Two weeks' duration. The skin of the back and flanks is very red and finely papular. Food tests positive.

Case 53. H. M., aet. 7 months. Breast fed. Eczema for eight weeks. At first vesicular, and now the skin of the face is reddened and thickened. Food tests positive.

Case 54. N. H., aet. 5 months. Breast-fed boy. The disease has been evident for five weeks. The face and scalp are a mass of excoriations and crusts. Albumin +.

Case 55. H. K., aet. 5 months. Breast fed. Intertrigo for three months, general eruption for two days, consisting of flat-topped, small-sized, pink papules on the forearms, trunk and legs. Fat +, starch +.

Case 56. R. H., aet. 16 months. Second attack similar in nature to the first, one year previously. The face, back of hands, and bends of knees are red, moist, oozing and crusting. Milk +, egg albumin +.

Case 57. I. M., aet. 3. Duration, perhaps a year. Both arms are raw. Child much neglected. Starch +.

Case 58. M. L. R., aet. 8 months. Breast-fed boy. Eruption present almost from birth. The buttocks show fine papules and excoriations. The mother says that the baby always breaks out after eating eggs. Egg albumin +, wheat +.

Case 59. O. C., aet. 10. Schoolboy. There are infiltrated and excoriated papules on the deltoid areas and on the abdomen. Albumin +.

Case 60. N. L., aet. 16 months. The cheeks and ears are erythematous and mildly exudative. Albumin ++.

Case 61. D. J. S., aet 3 months. Breast-fed boy.

Duration, two months. Both cheeks show indefinite, pink, dry and scaling areas. Fat +.

Case 62. M. L. P., aet. 1 year. Breast-fed boy. The scalp and face are red and moist. Albumin +++.

Case 63. R. M., aet. 7 months. Duration, six months. A generalized vesicular eczema, most emphasized on the face, scalp, neck and upper chest. Albumin +++.

Case 64. M. S., aet. 6 months. The skin of face, ears, trunk and arms is brilliant red, oozing and excoriated. Albumin +.

Case 65. I. S., aet. 3. This girl has spent more or less of her life in the skin ward. The whole body is red, at times moist, at others dry and scaling. Albumin +.

Case 66. M. C. S., aet. 12. Schoolgirl. The skin is generally dry and harsh and easily irritated. There are pinhead papules over the whole body. Fat +, starch +, milk +.

Case 67. S. H., aet. 3 months. For two weeks the scalp and upper part of the cheeks have been erythematous, vesicular and crusting. Albumin +.

Case 68. H. V., aet. 8 months. Duration, three months. Subacute exudative condition of the face, scalp, neck and upper chest. Albumin ++, starch +.

Case 69. R. C., aet. 2 months. Breast-fed girl. Vulvar region is claret-red, edematous and moist. Fat +.

Case 70. E. V., aet. 15 months. Duration, 12 months. The child is nursed and given Mellin's Food, cake, bread, etc. The cheeks and chin are red, infiltrated and crusting. Food tests (raw[*]): egg +. After one week's elimination of egg in all forms the skin is merely erythematous.

Case 71. R. D., aet. 4 months. Duration, 3½ months. The child is breast and bottle fed. Infiltration, fissures and crusts appear on the head and trunk. Food tests (raw): milk +.

Case 72. J. T. McC., aet. 11. Schoolboy. There was an attack of eczema six years previously. Oozing and crusting now appear on scalp, on forehead and behind ears. Food tests (proteids[†]): pork and tomato ±.

Case 73. I. F., aet. 12. The disease started ten years previously as an impetiginous eczema, following pediculosis, and has continued down to the present day. Under our care in the hospital ward, the child has promptly recovered but the disease has invariably returned when the child has gone home. Food tests October, 1915 (raw): egg +, butter ±; September, 1916 (proteids), all negative; November, 1916 (proteid), wheat +, tomato +, and egg +.

Case 74. C. T., aet. 5. Duration, 4 years. Oozing and crusting condition of the scalp. Food tests (proteids): corn ±, peas ±, strawberries ±.

Case 75. M. S., aet. 10 months. Duration, 8 months. Multiple excoriations of face. Food tests (proteids): pork ±, egg +, beef ++. Disease continued with ups and downs. The child was referred to the pediatric department, and their last record states that the baby vomited after nearly every feeding.

Case 76. F. S., aet. 10 months. Duration, 5 months. Excoriations on the cheek, and a moist, infiltrated, reddened area on the trunk. Food tests (proteids): lactalbumen ±, casein ±, barley ++. This baby subsequently visited a children's hospital and was given barley water, and returned to us soon after with small indefinite papules on the face, trunk and extremities.

Case 77. S. G., aet. 2 years. Duration, 1½ years. A moist eczema of face, neck, scalp, flanks, back and legs. Food tests (proteids): corn ++, wheat +, rice +.

Case 78. J. R., aet. 3. Duration always. The face is moist, red and crusting. Food tests (raw): all negative.

Case 79. M. P., aet. 19 months. Duration, 14 months. The child was breast fed for 11 months. Food tests (raw): egg ++, oats +.

Case 80. J. B., aet. 7 The disease began at the age of one month. The arms, flanks and lower legs are moist, fissured and crusting. Food tests (proteids): peas ±, oats ±, egg +.

Case 81. R. S., aet. 3. Duration, 8 months. The disease began on the scalp and eyelids. The mother noticed that the ingestion of tomatoes and strawberries always produced exacerbations. Food tests (proteids): egg ±, casein ±.

Case 82. R. L., aet. 2 years. Duration of disease, one month. The skin is red, infiltrated and dry. Food tests (proteids): all negative.

Case 83. Y. C., aet. 3 years. Three weeks' duration. The child was nursed up to the age of two years. The cheeks and thighs are dry and scaling in patches. Food tests (raw): casein +.

Case 84. J. C., aet. 2 years. Duration, 11 months. There are dry and scaly areas, especially about the shoulders. Food tests (raw): all negative.

Case 85. K. K., aet. 12. Schoolgirl. Duration on and off for 7 years. The skin is generally thick, dry and excoriated. Food tests (raw): all negative.

Case 86. E. S., aet. 13 months. Duration, 4 months. The child was nursed for eleven months. The forehead is infiltrated, red and excoriated, with a tendency toward papulation. Food tests (raw) all negative.

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[*] (Raw) means that raw materials (egg albumin, fat-free milk, lactose, or oatmeal water) have been used as testing agents.

[†] (Proteid) signifies the use of the professionally prepared so-called proteids.

CASE 87. J. K., aet. 1 year. Duration, 6 months. The face and scalp are covered with pea-sized, brick-red, rather moist, somewhat excoriated maculo-papules. Food tests (proteids): rye ++.

METHODS OF EXAMINATION OF FECES.

Macroscopic.

1. Note the color, odor, and consistency.
2. Look for mucus and for food residue, such as cellulose from vegetables, meat fibers, or gelatinous masses of undigested starch.
3. Reaction to litmus. Of considerable value in babies, but of little importance in adults.

Microscopic.

1. To disclose neutral fat, rub up a small amount of feces with water on a glass slide and add a few drops of saturated solution of sudan iii. Neutral fat globules stain a bright orange red. Any neutral fat is abnormal.
2. To determine "total" fat add 1-2 drops of glacial acetic acid and a few drops of sudan iii and heat. In this way all fat present is broken down into globules of fatty acids which stain a bright orange yellow. All stools contain a not inconsiderable amount of "total" fat, for which there is no acknowledged standard of measurement. Experience alone determines one's own standard.
3. To discover starch, rub up a small portion of the mass with water and add Lugol's solution. Starch granules become blue, and anything more than the smallest amount of starch is to be considered abnormal.

Such are the methods adopted by Dr. Lewis Webb Hill, to whom I am greatly indebted for many of these examinations.

STOOL EXAMINATIONS.

CASE 1. A child of three years, living upon an essentially adult diet. The disease had been present for eighteen months, and at entrance to the hospital the face, neck, axillary regions and chest were moist and oozing. The stools showed a moderate amount of free fat and soap and much coarse vegetable matter. After a two weeks' suspension of all fat from the diet the face was almost free from involvement. The child was then given the regular house diet, and skin and disposition rapidly reverted to the conditions observed at entrance. Fat-free diet was again instituted, and twenty-five days later the child was discharged free from all outward manifestations of her disease, save a slight scaliness behind the ears.

CASE 2. The child had been allowed to eat everything. Six months earlier a red area developed on the face, and was treated without success by several doctors. On entrance, the whole face and neck were covered with moist crusts, and the body showed generalized but isolated areas of infiltration, oozing and crusting. The stool was dark brown, ill-smelling and alkaline and revealed a large amount of free fat and soap. A fat-free diet was administered and in sixteen days fat had disappeared from the stools and the skin was greatly improved. Unfortunately, the parents then took the child away.

CASE 3. A child of four years showed on his face dry, cracking lesions and on his body a papular eruption. There were no fats in the feces but large numbers of vegetable fibers and cells, algae, cellulose and fruit and vegetable débris. The patient was put on a modified house diet, and in eleven days there were no longer signs of eczema. The child was then given a weighed carbohydrate diet, and one week later the eruption was as bad as at entrance. The proper diet was restored, and in two weeks the child left the hospital apparently well and was still free from eczema when it reported, two weeks later, the proper diet having been adhered to.

CASE 4. D. F., aet. 5. Eczema has been present for seven months and is rather generally distributed. The skin is slightly reddened, roughened, infiltrated and fissured and a few papules are evident. Stool negative.

CASE 5. J. R., aet. 20 months. Breast-fed girl. Child observed in second attack. The face and ears are red, excoriated and exuding. Nits are present. Food tests negative. Stool negative.

CASE 6. M. L. P., aet. 1 year. Breast-fed boy. Face and ears show pink-red papules. Albumin +++. Stool negative.

CASE 7. M. S., aet. 11. Schoolgirl. Eczema "for years" and at present the face is red, dry and furfuraceous and the skin of the body is generally red, thick and fissured. Food tests are negative. Stool negative.

CASE 8. H. M., aet. 9 months. Duration of disease, 8 months. Breast fed. The skin is reddened and thickened, and in places moist. Food tests are all positive. Stool negative.

CASE 9. R. M., aet. 7 months. Disease present for 6 months, and consists of generalized vesiculation, especially on scalp, face, neck and upper chest. Albumin +++. Stool negative.

CASE 10. P. F., aet. 11 months. Disease present for ten months. Breast fed for 3½ months. Face and left shoulder show a few persistent areas of red, slightly infiltrated, dry and slightly scaling skin. The stool shows an excess of fat.

CASE 11. M. S., aet. 6 months. Face, ears, neck, chest, trunk and arms are brilliant red, oozing and excoriated. Albumin +. The microscope shows a slight amount of fat and a considerable degree of soap.

CASE 12. I. S., aet. 3. A frequent visitor to our skin ward. The whole body, including the face and scalp, is red and infiltrated, in places dry and in places moist. Albumin +. Macroscopically a typical soap stool; microscopically there is a considerable amount of neutral fat and an excess of soaps.

CASE 13. M. C. S., aet. 12. A schoolgirl. The skin is generally dry and harsh and easily irritated. The scalp is dry and finely scaling. There are pinhead papules generally over the whole body. Fat +, starch +, milk +. Microscopically the stool shows a moderate excess of soaps.

CASE 14. J. T., aet. 20 months. Disease of 3 months' duration. Greasy crusts on scalp, and crusts and fissures on face. Food tests are negative. Microscope shows a moderate excess of soaps but no free fat.

CASE 15. E. G., aet. 7 months. Breast fed. Duration, 2 months. Over the whole face are thick, dirty, heaped-up crusts and excoriations. There are also a few papules on both arms. Nov. 30 and Dec. 8 and 13, a moderate amount of soaps were found microscopically.

CASE 16. T. J. G., aet. 21 months. Disease evident for 18 months. The right side of the face is pink and moist and shows a few papules. Albumin +. The stool is strongly acid, loose, foul, brothy, and shows gas bubbles. A few neutral fat droplets are present as well as an excess of soap. A fermentation type of stool, with moderate fat and sugar indigestion.

CASE 17. S. H., aet. 3 months. Duration, 2 weeks. Scalp and upper cheeks are erythematous, vesicular and crusting. Albumin +. The stool is soft, yellow, very acid and contains many soft small curds, considerable mucus and considerable fatty acids and soaps.

CASE 18. H. S., aet. 3 months. Duration of disease the same. Forehead and cheeks are oozing and crusting. Food tests are negative. Stools are rather watery, brownish-yellow, slightly acid, and contain a small amount of fat.

CASE 19. I. S., aet. 8 months. Bottle fed. Disease 2 weeks' old. Skin of back and sides very red and shows pinhead papules. Food tests are all positive. Five examinations of the stools revealed many soap suds, some soft curds, some mucus. The sixth test, when the eczema was practically gone, revealed a normal stool.

CASE 20. E. B., aet. 6 weeks. Breast-fed girl. Two weeks' duration. There are minute miliary papules over both cheeks and on the scalp. The diaper region is generally reddened. Food tests are negative. Stool is spongy and yellow; contains curds and a moderate increase of neutral fats and soaps.

CASE 21. C. F., aet. 6 months. A girl, breast fed for six weeks only. Eczema present for three months. The cheeks are fiery red and moist. The hands, forearms, lower legs and feet show intracutaneous papules. The stool shows a very rare neutral fat droplet and a moderate excess of soaps and fatty acids.

CASE 22. R. F. G., aet. 6 months. A breast-fed girl. Duration, 3½ months. The cheeks show small areas of redness, moisture and excoriation. The stool is very acid in reaction and shows a moderate excess of neutral fat and a very large excess of soap and fatty acids.

CASE 23. E. L. Y., aet. 2 years. Duration, approximately 18 months. At first marked egg anaphylaxis was present but eventually outgrown. For last few months the disease has been present in the scalp, which at present is buried under a mass of white, granular scales. Stool shows a large excess of soap.

CASE 24. F. G., aet. 1 year. Scalp, face, lower arms and back are red, infiltrated, oozing and crusting. Food tests are all positive, Oct. 20, and all negative two days later. Stool shows a large excess of undigested starch.

CASE 25. H. V., aet. 8½ months. A breast-fed boy. Duration, three months. Scalp, face, neck and upper chest are mildly exudative. Albumin ++, starch +. The stool is green, loose, strongly acid, and contains a moderate excess of starch—"a typical stool of carbohydrate indigestion."

CASE 26. R. C., aet. 2 months. A breast-fed girl. Disease present since birth. The vulva is red, moist and edematous. Food test is positive to fat. The stool shows a typical fermentative diarrhea due to excessive carbohydrate fermentation.

CASE 27. Miss P. A., aet. 15, has a typical nummular eruption on the arms and legs, of two years' duration, and has consulted two other doctors. In these oval or circular, sparsely scattered areas the skin is infiltrated and finely papular. Dr. Hill reports: a loose, foul stool containing an excess of cellulose residue in the form of pieces of orange and gelatinous masses of vegetable material. Microscopically there is no excess of fat or of starch. A stool of cellulose indigestion, and the patient probably eats too fast and does not chew her food properly. She is unable to digest her coarse food. Such feces indicate inability to take care of starch if it is in the form of hot bread, large amounts of potato, etc.

CASE 28. Miss. E. A. C., aet. 15, developed eczema five years previously after an appendectomy, and now presents a lichenoid, excoriated eruption on the flexor surface of the upper and lower arms, over the scapulae and about the neck. Dr. Hanson reports: microscopically, no free fat or starch, but there are small amounts of soaps and undigested matter. Gas bacillus present. The test shows evidence of carbohydrate fermentation.

CASE 29. Miss M. E., aet. 7, presents a universally brown-red, leathery, and excoriated skin. The child has had eczema for 4½ years and is at present thoroughly exhausted mentally and physically from the intense itching and consequent loss of sleep. Dr. Hanson reports: no free fats or fatty acids, very little starch, but there is considerable cellulose and marked evidence of carbohydrate indigestion. Gas bacillus present. The movement not formed; the odor rather bad.

CASE 30. F. L. Y., aet. 5. Disease began at age of six months, and has persisted, despite treatment from a pediatrist. At present there is a scaling area above the right eyebrow and many finger tips are dry, red and cracked. Dr. Hill reports "a very peculiar stool. Macroscopically the stool is hard, formed and large, and looks normal, but when broken apart is seen to consist almost entirely of green peas, most of which are not at all digested. Microscopically, there is no excess of fat, but naturally a large excess of starch." One week after the reformation of the diet the mother reported that a previously foul breath had become sweet; that a nervous, irritable disposition had become docile; that chronically pale cheeks had become pink; and that the eczema had decidedly improved.

Case 31. V. T., aet. 14 months. The child was nursed for three months, and then oatmeal water, eggs and various patent foods were added to the diet. With these changes in the diet, eczema developed, and with the administration of eggs vomiting and convulsions appeared. The face is red and covered with fine excoriated papules. Stool: soft, grayish brown, acid and contains much cellulose; starch is increased in amount. The eczema cleared up within a week under proper diet.

RÉSUMÉ OF FOOD TESTS.

1. *Moist Eczema.*

Negative to all foods injected	14
Positive to one food injected	13
Positive to more than one food injected	22
Positive to egg albumen	23
Positive to salt-free butter	7
Positive to fat-free milk	11
Positive to oatmeal or lactose	6

Of those injected with the so-called proteins there were two children positive to each of the following substances: pork, tomato, wheat, corn and peas; and one positive to strawberry, rice, oat, casein and beef.

2. *Dry Eczema.*

Negative to all foods injected	7
Positive to one food injected	4
Positive to more than one food injected	9
Positive to egg albumen	4
Positive to salt-free butter	5
Positive to fat-free milk	5
Positive to oatmeal or lactose	0

Of those injected with the so-called proteins there were two children positive to casein, one positive to lactalbumen and one to barley.

3. *Papular Eczema.*

Negative to all foods injected	8
Positive to one food injected	1
Positive to more than one food injected	9
Positive to egg albumen	3
Positive to salt-free butter	2
Positive to fat-free milk	2
Positive to oatmeal or lactose	2

Of those injected with the so-called proteins, there was one child positive to rye and one to wheat.

RÉSUMÉ OF STOOL EXAMINATIONS.

1. *Moist Eczema.*

Stools negative	8
Stools containing an excess of fat or soaps	11
Stools containing an excess of starch	2
Stool containing an excess of cellulose	1
Fermentative stools	2

2. *Dry Eczema.*

Stools negative	2
Stools containing an excess of fats or soaps	3
Stools containing an excess of starch	2

3. *Papular Eczema.*

Stools negative	1
Stools containing an excess of fats or soaps	3
Stools containing an excess of cellulose	3
Stool containing an excess of starch	1

CONCLUSIONS.

At the end of three years of concentration on the subject of eczema and of working and pondering over one positive and two possible accessories to our therapeutic armamentarium, I feel justified in making the following deductions:

1. There are two great types of eczema,—those curable in the hands of an expert and those which resist even the most scientific care. These two classes cannot be distinguished objectively.

2. Crude coal tar when properly used is curative in the majority of instances of moist eczema, and has proved of inestimable value.

3. There is no doubt that eczematous individuals, both young and old, react positively in decided numbers to the food tests and stool examinations—in fact we have seen among the children described in this communication 66% of positive food tests and 81% of abnormal stools. Therefore, we do not hesitate to say that food plays some rôle in the abnormal composition of individuals afflicted with chronic, rebellious eczema.

4. Proper feeding, as indicated by food tests and stool examinations, is capable in very young children (who eat elemental food), of producing a cure or of paving the way for a cure in a decided majority of cases.

5. In older children and in adult life the same successful results have been obtained only in a small minority of the cases; but it is possible that this failure is due less to the value of this same knowledge than to the fact that the food of this class of patients is practically always a complex substance and hence incapable of such scientific and exact preparation as is possible in the comparatively simple modification of milk. Until, therefore, we are able by means of special diet kitchens, let us say, to synthesize the food of older children and adults, we cannot hope to make use of these two modern therapeutic adjuncts in our fight against unamenable eczema.

Original Articles.

LIPOIDS IN 131 DIABETIC BLOODS.

By Horace Gray, Boston.

[From the Department of Biological Chemistry, Harvard Medical School.]

Synopsis.

- Nomenclature
- Base table of data
- Specimens *vs.* cases
- Technique
    - Extraction
    - Bloor's fat method
    - Lecithin method
    - Cholesterol method
    - Time required for each method
- Formulae
    - Determined values
    - Calculated values
- Checks
- Discussion of results
- Clinical simplification
- Threshold
- Average and maximal diabetic values
- Plasma *vs.* corpuscles
- Anesthesia
- Sex
- Duration
- Prognosis
- Weight
- Dietary fat
- Fasting
- Acidosis
- Carbohydrate balance
- Blood sugar
- Corpuscle per cent.
- Cloudy plasma: lactescence *vs.* hyperlipemia
- Individual patients, instead of groups, in relation to some of the above factors.
- Clinical severity
- Summary

These analyses were undertaken as a continuation of the series of 38 reported by Professor Bloor September, 1916, on patients of Dr. E. P. Joslin. For the clinical data and much other assistance, I am indebted to the latter; and to the former for frequent and extremely obliging help and advice on the details of his methods.[1-8]

The study of patients from the dietary and metabolic viewpoints has produced blood micromethods for all four of the familiar food elements: protein (Folin), carbohydrate (Lewis-Benedict), fat (Bloor), and salt (McLean-Van Slyke). The first two of these are both generally used in hospitals and generally understood outside them. Neither the plasma-chlorides nor the lipoids, however, have yet received the general attention which they merit. In the case of the lipoids the cause has probably been fivefold:

1. The confusing nomenclature.
2. The confusing number of substances determined.
3. The confusing variation of methods with resultant varying values.
4. The recent improvement of methods.
5. The time required.

NOMENCLATURE.

The nomenclature has been recently discussed,[7] and will, therefore, be only graphically reviewed. Each vertical column consists of words used more or less synonymously, the first term in each being used throughout this paper.

Lipoids
Blood-fat
Lipins
Fats

Glycerides Glycerides of fatty acids Neutral fats True fats Ordinary fats Uncombined fat Fat	"Lecithin" Phosphatides Lipoid phosphorus Lecithin and Cephalin	Cholesterol Cholesterin
	Cyto-lipoids Lipoids	

The results are partly determined and partly calculated from the following three methods:

Bloor's Fat Method	Lecithin Method	Cholesterol Method
	giving respectively	
I. Total cholesterol II. Total fatty acids combined in *a* glycerides *b* phosphatides *c* chol.-esters	I. Lecithin II. Cephalin III. Other phosphatides	Total cholesterol including *a* free cholesterol *b* cholesterol as esters of fatty acids

Particular attention is directed to (1) the term "Bloor's fat-method," which has seemed preferable to Bloor's original name, "total-fat," so easily confounded with the name "total lipoids" (total ether soluble, aggregate fatty substances), and in fact amounting to only 91% of the latter "total"; also to (2) the use of "lipoids" for the fatty substances in general, and not in the restricted way as a synonym for "cyto-lipoids."

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[1] Bloor, W. R.: A Method for the Determination of Fat in Small Amounts of Blood, Jour. Biol. Chem., April, 1914, xvii, 377-384. This is the method which I have called Bloor's Fat-Method, throughout this paper.

[2] Bloor, W. R.: A. Method for the Determination of "Lecithin" in Small Amounts of Blood, Jour. Biol. Chem., August, 1915, xxii, 133-144. The $AgNO_3$ precipitation has been superseded by the method quoted below (6).

[3] Bloor, W. R.: A Simple Method of Converting the Duboscq Colorimeter into a Nephelometer, Jour. Biol. Chem., August, 1915, xxii, 145-149.

[4] Bloor, W. R.: Fat Absorption and the Blood Lipoids, Jour. Biol. Chem., November, 1915, xxiii, 317-326.

[5] Bloor, W. R.: The Determination of Cholesterol in Blood, Jour. Biol. Chem., March, 1916, xxiv, 227-231.

[6] Bloor, W. R.: Fat Assimilation, Jour. Biol. Chem., April, 1916, xxiv, 447-460. Includes revised Lecithin method.

[7] Bloor, W. R.: The Distribution of the Lipoids in Human Blood, Jour. Biol. Chem., July, 1916, xxv, 577-599.

[8] Bloor, W. R.: The Lipoids of the Blood in Diabetes, Jour. Biol. Chem., September, 1916, xxvi, 417-430.

The analytical and clinical data were collected in a table which was then used as the basis for all the later tables and deductions given below. Expense unfortunately makes reproduction of this table of basal figures out of the question. If any question should arise, I should be glad to give the actual pertinent figures from the table.

SPECIMENS VS. CASES.

The 131 bloods analyzed represent specimens, not patients, of whom there are 86 in this series. If Bloor's fat-method ("total-fat") be taken as a criterion, then the most similar values are found in 4 different *persons*.

TABLE I.

SIMILARITY OF VALUE IN DIFFERENT PERSONS.

SPEC. No.	NAME	HISTORY No.	
129	Ch	1086	1.9%
517	Em.	1055	
522	Sw	1228	
558	La	1233	

TABLE II.

DISSIMILARITY OF VALUES IN SAME PERSON.

History No.	No. of Spec.	Nearest	Farthest
La 1233	10	1.09 1.10	1.09 3.62
Cl 786	8	2.70 2.74	2.28 9.55
Co 610	5	0.97 1.03	0.97 1.56
Sw 1228	4	0.78 0.90	0.62 1.09
Ma 1070	4	0.66 0.67	0.66 0.95
Hr 1213	4	1.42 1.45	0.76 1.52
Wa 1085	3	2.74 2.94	0.84 2.94
Ro 1196	3	1.01 1.18	0.79 1.18
St 914	3	0.88 1.32	0.88 1.89
Mk 1232	2	0.81 0.83	0.81 0.83
Si 1207	2	0.68 0.87	0.68 0.87
Po 1160	2	0.96 1.08	0.96 1.08
Oa 1227	2	1.05 1.61	1.05 1.61
Cw 942	2	1.06 1.53	1.06 1.53
Du 815	2	1.53 1.75	1.53 1.75
Other 3 cases		One of necessary figures wanting	

But this similarity, in fact identity of value, is not found in different specimens from any of the 18 persons who have furnished more than one specimen. The nearest two values for each are given in Table IV, together with the number of specimens from that individual analyzed by this method. In other words, here are four patients agreeing more closely than any one patient alone. Furthermore, each individual shows remarkably wide variations, as is also tabulated. Hence the justification for discussing primarily specimens rather than case-numbers.

TECHNIC.

The methods used throughout have been exhaustively described by their author and will not be repeated. There are, however, a number of details that may be worth recording, or emphasizing.

EXTRACTION.

The patient's blood may be kept from clotting by addition of the familiar crystal of potassium oxalate, making a strength of about 0.1%; or by saturated solution of sodium citrate, 1 drop to each 5 cc. or less of blood. With thorough shaking for 1 minute, the latter is sufficient to prevent coagulation and seems less apt than oxalate to result in hemolysis. Hemolysis when marked certainly makes an increased lipoid yield.[1] In very hot weather more speed and more anti-coagulant may be necessary. That the amount of citrate recommended above is sufficient is supported by a recent statement: "Sodium citrate mixed with blood in the proportion of 1:100 inhibited coagulation for 4 days when kept at a temperature of 10° C."

Salant, W., and Wise, L. E.: The Action of Sodium Citrate and its Decomposition in the Body, Jour. Biol. Chem., December, 1916, xxviii, 27-58, p. 57.

According to the above proportion one drop of the saturated solution, which contains 0.77 parts of sodium citrate, should inhibit coagulation in 77 drops of blood, *i.e.*, about 5 cc. Of this citrated blood 10 cc. are desirable, though 3 cc. are enough for determinations on the whole blood alone.

Culbreth, D. M. R.: Materia Medica and Pharmacology, Phila. and New York, 1917, p. 707.

It is desirable to redistil both the alcohol and ether used for extracting the original whole blood and plasma, for taking up the dry residue in Bloor's fat-method and for making the oleic acid standard.

Pipettes made in this country are by no means so reliable as those of the standard German makers and often need to be recalibrated. It is convenient to get or make a 7 or 8 cc. pipette to use for extracts that one expects to be a little strong for 10 cc. yet weak for 5 cc.

Beakers 9 cm. high are vastly preferable to those only 6 cm., which require closer watching of their sides to see that the moisture does not gradually creep up and then spatter. The bottoms of such 150 cc. beakers will then measure 4-5 cm. across; the exact diameter does not matter but the flatness does. It is important to go over a large lot and select the flatter ones. With these evaporation on an electric stove proceeds more smoothly.

Evaporation to dryness in all three methods requires less attention when done on the water bath rather than the electric stove.

After measuring out the 3 cc. portions into about 60 cc. of alcohol-ether, a routine practice has been made of letting stand 48 hours before raising to a boil. No attempt has been made to determine whether as complete extraction would be obtained if the boiling, cooling and making-up were done immediately—an obvious desideratum in applying the method to clinical work.

BLOOR'S FAT-METHOD ("TOTAL-FAT).

The standard has been made by weighing out Kahlbaum's "K" oleic acid, 210-240 mg., dissolving in redistilled ether and washing over with repeated portions, making 125 cc. ether in all, into a 500 cc. volumetric; making up with redistilled alcohol nearly to the mark; letting warm up again to room temperature and filling to the mark. Of this solution 5 cc. equals slightly more than 2 mg. oleic acid. Since one lot of this solution was noted to increase in value, presumably by evaporation, though the cork was neither accidentally left out nor noticeably loose, the making of large amounts at a time has not seemed advisable. The stopper should be of cork, forced in hard.

The evaporated residue with the added 5 cc. alcohol-ether, and the parallel 5 cc. of standard, are warmed just to a boil on the electric stove. Rapid boiling is facilitated by a little sand, previously cleaned with acid and alkali. On removal, the beakers are rotated gently half a dozen times while the excess ether is blown off. Four pairs at a time may be carried to this point. Distilled water, 50 cc. from a delivery pipette or even a simple calibrated graduate is run down the side of one unknown and its standard, then the HCl¼ (1:3). This may conveniently be kept in an unstoppered pint bottle with the 2 pipettes standing in it. Part of the five minutes after precipitation may be employed in transferring to the nephelometer tubes.

Bubbles have been frequent in the standards and nearly invariable in the unknowns. The high reflection from these increases the value, and their removal is, therefore, essential. I have used several methods:

1. Blowing off the excess ether longer and with more shaking of the beaker.
2. Heating the tubes in a bichromate-sulphuric acid cleansing solution weekly.
3. Boiling the distilled water, then cooling it to room temperature before use. Not much help.
4. Tapping the tubes against a block of wood with 2 holes, which is useful for carrying the tubes into a dark room next door. Though one tube becomes free of bubbles sooner, still it should be tapped approximately as often as the other, so that whatever disturbance there is of the colloids may be equal in both. Often necessary.
5. Inverting two or three times. Seldom necessary.

After putting the tubes in the nephelometer, one should examine them again to make sure that the side toward the light has not been smeared with the moisture which often gets on the fingers during the tapping just mentioned.

The N sodium ethylate may be conveniently made as follows: metallic sodium is taken from the tin; or from paraffin oil, in which case it is wiped with filter paper; a piece cut off and peeled, weighed to slightly more than 2.3 g., agitated with forceps in about 50 cc. ordinary ethyl alcohol till clean white, *i.e.*, about 10 seconds; transferred to 100 cc. freshly distilled absolute alcohol in a 200 cc. Erlenmeyer flask, covered with a beaker, put under the cold tap till dissolved, *i.e.*, 20-30 minutes; plugged with a rubber stopper pierced by a 2 cc. pipette and kept in the dark. The solution generally acquires a light brown color in 24-48 hours. Peelings should be left in the air until thoroughly oxidized to a crumbly white powder—NaOH and Na_2CO_3, and only then thrown in the slop jar.

That 2 cc. of this solution is ample to saponify is clear from the following calculation: suppose 5 cc. of the standard total-fat solution as made contains 2.3 mg. oleic acid. Now the amount of unknown extract used must contain less than $\frac{5}{3}$ as much, since even that requires a correction, and any stronger solution cannot be read in the nephelometer at all. This amount of extract then, whether it happens to be 10 cc., 1 cc., or even *x* cc. of a diluted extract (say 10 cc. of the lipemic extract made up to 100) cannot contain more than $\frac{5}{3} \times 2.3 = \frac{11.5}{3} =$ 3.8 mg. fatty acid. Now 1 cc. N Na-ethylate will saponify 1 cc. N oleic acid, $C_{17}H_{33}$ COOH, $C_{18}H_{34}O_2$, which contains 282 mg., *i.e.*, 74 times as much as the 3.8 mg. that can be determined nephelometrically.

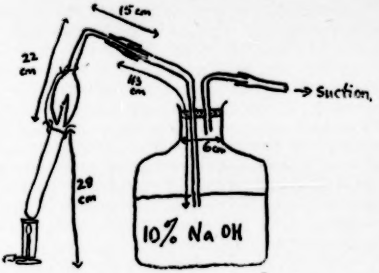
LECITHIN.

The phosphate "stock" was made according to the published directions,[2] but the "standard" was made by diluting 30 cc. up to 500 cc., after which 5 cc., instead of the original 3 cc. = 0.15 mg. H_3PO_4. The fourth lot of standard became mouldy two days after making, and simultaneously weaker—an event which was surprising in a weak phosphate solution (well-recognized medium for moulds), only because it had been absent in the first three, made from the same stock under apparently identical laboratory conditions. The next lot was, therefore, boiled and cooled before filling to the mark.

A convenient way to hang the tubes in the water bath is by a rubber band round the necks of every pair, across a glass rod; or if that does not lower them the desired centimeter into the water, then across a bent wire. When the bath is steaming actively, the necessary shaking until boiling can be comfortably done with a clean brass crucible tongs, each tip in one of the pair of tubes.

The Folin-Denis draught apparatus,[9] as modified somewhat by Dr. Bloor, seemed rather more compact than the original and was, therefore, copied. Four absorbers can be arranged in one cork. The tubes are hung by copper wire, about 25 cm. of 16 gauge being needed for each. The other measurements are given approximately in Diagram I.

Diagram I.



The first stage of digestion at a low boil is difficult when the tubes and beads are new and not yet etched, for then the boiling is apt to be either wanting or too active; under these circumstances 30 minutes of intermittent attention has been satisfactory. For the second stage the "gradual" raising of the flame is necessary only so far as to prevent the fumes from flooding the absorber and so overflowing into the air of the room. The nitric fumes will be off after 3-5 minutes; then one must watch more carefully since the usual ten minutes may easily make the tube go dry and crack.

It is often convenient to stop for the night at the end of digestion, or occasionally at the end of the first stage. This should make no difference theoretically, and practically does not. In the following duplicates the first stage of each first specimen was done, and 8 days later the rest of the determinations on those first specimens and the entire determinations on the second specimens.

I.	.500	.611	.336	.205	.381	.440
II.	.500	.611	.307	.212	.381	.428

The cane-sugar solution moulds easily and has, therefore, been boiled about every fortnight.

For the titration the alcoholic phenolphthalein solution must be 0.3%, not the common 1%, for that makes a faint cloud.

For acid H_2SO_4 1:1 was used. The NaOH need be only approximately 20%. In general, not more than 3 cc. should be necessary, provided the digestion is sufficiently prolonged.

The manufacture of the wonderfully delicate Kober-Egerer modification of the Pouget-Chouchak reagent has been the greatest difficulty of these analyses. I have followed the directions carefully in making sodium molybdate and from that the strychnine molybdate, several times with success, but also often without, so that I have had to depend repeatedly on Dr. Bloor's kindness in making it for me.

After precipitation of the phosphorus in the parallel unknown and standard 10 cc. aliquots, by running each into a 50 cc. volumetric containing the above reagent, the flasks should be made up to the mark promptly, to equalize the condition of the colloids.

The values in this paper are comparable with each other and also with the normals quoted, since all have been obtained by the same method,—Bloor's modification without sodium ethylate. But in case the reader should wish to compare them with diabetic values from other laboratories, it should be noted that different values, *e.g.*, for normal, are obtained by other methods, of which there are several in the literature.

Owing to the expense of acetic anhydride, Dr. Bloor now recommends 1 cc. instead of 2 cc. That this is equally satisfactory is shown by the following duplicates:

2 cc.	.495	.730
1 cc.	.500	.724

The electric bulb used has been a 100 w. Mazda nitrogen filled. After two of these had died of age within 6 months, without any rough usage whatever, the expense made it seem desirable to get along with an ordinary bulb. A 25 w. was difficult, however, and even a 40 w. so unsatisfactory that I procured another like the original. Probably the ordinary 100 w. Mazda, not gas-filled and therefore cheaper, would be satisfactory.

The Corning Daylite Glass Set B 30 at my disposal consisted of three plates. These absorbed not only the yellow rays, but so much of the illumination that only 1 plate could be used with the 25 w. bulb, and with the 40 w. not more than 2. With the ample illumination of the 100 w., curiously enough, 2 plates remained more satisfactory than the full set of 3. This point was confirmed by another observer, skilled in reading the colorimeter, as also the observation that the use of no plate gave the same reading as the blue-green alone. With the weak bulbs, when only 1 plate could be used, the most satisfactory to my eye was the blue-green, 78.5%; then the pale-purple, 59%; and least the violet, 115%.

The use of the colorimeter or nephelometer has many pitfalls. These have been commented

[9] Folin, O., and Denis, W.: Jour. Biol. Chem., 1911-12, xi, 503.

on by various observers, no one of whom, however, seems to me to have altogether covered one of the most troublesome points.

Kruss, G. and H.: Kolorimetrie und Quantitative Spektralanalyse, Ed. 2, Hamburg and Leipzig, 1909.
Kober, P. A.: Jour. Biol. Chem., 1913, xiii, p. 485.
Marriott, W. M.: Jour. Biol. Chem., November, 1913, xvi, p. 290.
Folin, O., and Denis, W.: Jour. Biol. Chem., September, 1916, xxvi, p. 484, 473-489.
Lyman, H.: Jour. Biol. Chem., March, 1917, xxix, p. 170, 169-178.
Kober, P. A.: Jour Biol. Chem., March, 1917, xxix, pp. 155-168.

The usual preliminary to reading an unknown is to read the standard as an unknown against itself, and to take the value as the potential height of the standard. This has been also stated in other ways. The procedure is about as follows: The standard on the right is set at say 20, then read on the left (1-5 times according to different authorities), and found to be say 20.2. It is left at that point and the standard on the right is replaced by the unknown which is then read. In the ensuing calculation the standard is 20, not 20.2. Even after a month's practice reading turbidities in some unpublished acetone determinations, I found that my readings were not consistently 20.2, but varied sometimes by more than 2%±, even when the instrument was not moved at all from its position in the light box. This was of course unsatisfactory. When, however, the preliminary was made to consist in setting the standard at 20 on both sides *and looking through the telescope carefully for a moment, the eye seemed to become trained;* so that after an interval of 10 seconds the standard *could* each time be read against itself within a variation of less than 1%± from the usual level of say 20.2. This balancing of the instrument was found necessary after each 4 unknowns.

For example, using 4 samples of the same chloroform extract and adding acetic anhydride and H_2SO_4 to each like an unknown, the values got were: 16.6, 16.8, 16.7, 16.8, none of which varies from the average 16.7 by as much as 1%, which is much less than the error of the method as a whole. Other observers with the nephelometer or colorimeter recommend variously repeating the balancing after each 1, 2 or 4 unknowns.

Unknown readings below 9 or above 20 have always been rejected and done over again.

No attempt has been made to use for a standard the aqueous solution of Naphthol Green B suggested by Bernard and found satisfactory by Myers and Gorham.

Myers, V. C., and Gorham, F. D.: The Chemical Composition of the Blood in Health and Disease, The Post Graduate, 1914, xxix, 938.

(To be continued.)

Medical Progress.

PROGRESS IN DERMATOLOGY.

BY JOHN T. BOWEN, M.D., BOSTON.

SCALP DISEASES AND HATS.

MANHEIMER[1], the Secretary of the American Association for Promoting Hygiene and Public Baths, has written an article on this subject which embraces observations on the retail hat trade. He states that there are few positive data as to the prevalence of skin infection among the general population inasmuch as most of these cases are not reportable, but considers that a further administrative control is quite warranted. In the report of the Director of Child Hygiene of the Department of Health of New York City for 1910, it was found that 59 per cent. of the children examined had pediculosis capitis. In Philadelphia 33 per cent. were observed. The time lost from treatment for pediculosis was therefore vastly greater than that from all other affections put together. The writer emphasizes the enormous prevalence of pediculosis among the adult population generally, and states that it is one of the most frequent conditions met with in physical examinations of recruits for the army and navy. The spread of typhus fever by means of head lice is well known, and this circumstance should be given serious consideration in view of our present military preparations. With regard to syphilis, the comparative frequency of extra-genital initial lesions is referred to, Montgomery being cited as estimating that at least 10 per cent. of all the syphilis in this country is extra-genitally acquired. Many syphilitics offer lesions of the scalp, and in these cases there is great danger from the trying on of hats. Acne, impetigo contagiosa, and ringworm are diseases common in school children, which may be transmitted from one to another. ~~Leprosy~~ and erysipelas are other infectious maladies discussed. With regard to the *transmission of infection through hats,* a study of infections traceable to this source was undertaken. During the busy season a great many hat shops were inspected and many retail salesmen were questioned. By actual count, it was found that over 2% of the men trying on hats had noticeable eruptions on the face and forehead. Almost all of the salesmen admitted that no one would be forbidden to try on a hat, whatever might be the obvious condition of his forehead and scalp. Although the sweat bands of hats frequently become soiled, they are very rarely changed, unless in very bad condition. Almost all purchasers try on at least four hats before selecting one, hence the opportunity for a person with a discharge from his forehead infecting a number of hats. In the better class of shops a head conformator is used in order to shape the hat properly on a block, and this being used on all customers may easily become contaminated. In some shops this has been provided for by the employment of small paper skull caps for the protection of the head. The universal use of this protective cap is advocated, not only in the case of conformators but while fitting hats in general, as the paper being cheap, it can be discarded after each use.

TREATMENT.

Pure Coal Tar.—Semon[2] relates his successes with coal tar at a base hospital in France, using a mixture containing equal parts of pix carbonis B. P., acetone and flexible collodion. He applied this paint in various skin affections, and the results were satisfactory with very few exceptions. It is to be remembered, now that it is so difficult to obtain synthetic and other drugs, that tar is cheap, easily procured, and requires as apparatus only an ordinary house-painter's brush. It is a cleanly application after it has dried, and all traces may be removed from the clothing and from the skin in a very few minutes by means of ether. It is remarkable how well the most delicate skins will stand pure tar. It was found to be well tolerated on the skin of the knee flexures, the elbows and the wrists, as well as on the scrotum. It was used with success in aural eczema. He considers it the best antipruritic medicament we possess, sometimes curing local itching when x-rays fail. It is remarkable how rapidly the pruritus is often cured—in fact, if improvement does not occur at once, the case may be regarded as unsuitable and not likely to be benefited by further application. The cases of skin diseases occurring in military encampments are naturally not very varied, and scabies formed the greater number of the cases observed. These cases were usually complicated with dermatitis, furunculosis, impetigo, eczema, etc. In cases where the dermatitis had ended in a chronic eczematous condition, the tar was found to be invaluable, but was useless in impetiginous states. Nor is it applicable where there is a complication with furunculosis. It is very valuable in lichenoid conditions, and when there is a dermatitis of a vesicular or papulo-vesicular nature. Seborrhoea was a frequent occurrence, possibly from the continuous use of steel helmets, and the impervious mackintosh linings of the cloth service caps. In some of the less acute forms of this affection, the tar paint was found to be very effective. In psoriasis, which is so closely related to seborrhoea, isolated plaques covered with thick scales were removed after four days painting, without any preliminary scrubbing or removal of the scales. It was found very valuable in lichenification.

Sulphur Fumigations for Scales.—Bruce[3] recommends in camps the treatment of scabies by sulphur fumigation. The patient is given a hot bath and allowed to soak for at least five minutes in the water, well lathered with soap, either soft soap or yellow bar, and the skin scrubbed to open the burrows. He is then put in a warm cabinet used out of doors, his head protruding through an aperture in the roof, and subjected to the fumes of a lighted sulphur candle placed inside the cabinet. An orderly must remain in constant attendance with instructions to remove the patient at once if he should show signs of faintness or difficulty in breathing. He is kept in the cabinet from forty to fifty minutes, when the lid is quickly removed and the patient returns to the bathroom, where he puts on clean, warm clothing. It is of course necessary to send with the patient all his kit, including blankets and pillow, which may be treated by a steam disinfector, or in the cabinet when only one case is being treated. Boots and other leather articles may be treated by formalin spray or in the cabinet. It is important to see that the cabinet is warm and that it contains water vapor. The best results are obtained in recent cases with little induration, and one application will invariably cure these cases; when there is much induration, a second application is given at the end of forty-eight hours. There is immediate relief from itching and irritation, and sleep is not interfered with. It is very rarely that there is any resulting dermatitis; but if so, it is easily reduced. There is sometimes a slight general branny desquamation about forty-eight hours after the treatment. Bruce has treated about 200 cases, and has had two per cent. of returns, which he feels certain was due to the fact that some article of clothing had escaped disinfection. The treatment is rapid, certain and cheap, and one candle treats ten cases. If the clothing can be rapidly disinfected, cases can be returned cured to their units on the day of admission. The treatment if carefully carried out is in no way disagreeable to the patients.

The Electric Cautery.—Hazen[4] extols the value of the electric cautery in cutaneous urgery, especially in the treatment of soft corns, granuloma pyogenicum, lupus vulgaris, keratosis, papillomas, pigmented moles, xanthelasma, cancer, leukoplakia, and for the removal of tissue for diagnostic purposes, where malignancy is suspected. With regard to other modes of destruction, he considers that the caustics have certain marked disadvantages, in that the superficially acting ones are applicable only to surface cases, whereas in the more deeply acting ones, such as arsenic, the pain is usually very intense, and their use does not permit histological examination of the tissue removed. Carbonic dioxide snow is quick and usually not painful, but does not usually act deeply enough, and is worthless in cancer or tuberculosis. It is valuable chiefly in the case of certain angiomatas, and of lupus erythematosus. Hazen does not think, from his personal observation, that fulguration or diathermy have any value superior to that of the caustic. The electric needle is well adapted to the removal of small superficial non-malignant conditions, as it is painless and leaves excellent cosmetic results. He considers that the field of the roentgen ray and of radium is small. For many affections they are ineffective unless their action is carried to the point of producing a burn, which is recognized to be a dangerous procedure. The curette does not touch the outlying morbid cells that are usually to be found in otherwise normal tissue. The knife is undoubtedly the cleanest way of treating many lesions, particularly the non-malignant neoplasms, and affords the best tissue for pathological examination. The actual cautery is better adapted to heavy work, the electric cautery to light work, as it is mechanically easier to operate and to keep at a steady heat, either dull red or bright red. It is exceptionally cleanly, and scrubbing and sterilization of the hands, of the instrument, and of the patient may safely be omitted. The operation may be done quickly and no dressings required, and the crust is the best dressing. It is the ideal instrument in cases where it is impossible to leave much margin. The writer states that all surgeons are agreed that in malignancy there are fewer recurrences after the cautery than after the knife. The cosmetic results are excellent, and tissue can be obtained for histological examination. In lupus vulgaris deep cauterization is necessary, as otherwise there is sure to be a recurrence. Soft corns are excised with a fairly heavy blade, and the lymph vessels that feed them at the base thoroughly cauterized. In the case of keratosis and papillomas the edge of the blade is inserted at the border of the lesion and then shoved along beneath it. Lesions on the eyelids and pigmented moles are very successfully treated by this method. Malignant growths are excised just as with the knife and local anaesthesia is employed in all cases.

The Coolidge Tube in Non-Malignant Skin Affections.—Howard Fox[5] states that only since he began to employ the Coolidge tube has his roentgen ray work in the treatment of skin diseases been really satisfactory. He strongly advocates the use of measured dosage in roentgen ray treatment, the Coolidge tube being used, as it greatly assists in attaining this object. On account of the remarkable constancy of this tube, it has been possible to treat cases of acne and eczema in a routine manner without the slightest danger of ill effect. Fox's best results were obtained in cases of eczema, of which all types were treated except the very acute vesicular forms. He treated 60 cases in all, varying from papular and vesicular eruptions of a few weeks' duration to chronic thickened patches that had lasted thirty years. Of these, 39 responded well to the treatment, especially nine cases in which the palms and soles were affected, and 2 cases in children of 4 and 2½ years respectively. In 16 cases the lesions were either entirely cleared up or greatly improved, but later relapsed somewhat. In ten cases the results were indefinite and 3 cases failed utterly to respond. His results in psoriasis were, in general, disappointing, for although the lesions were quite easily cleared up, they promptly returned. It was found particularly useful in lesions of the hands and face when chrysarobin is objectionable, and in isolated patches. Of 19 cases treated, the results in 8 were distinctly favorable. In one, a patch of psoriasis on the abdomen, which had resisted chrysarobin, disappeared after five treatments. Four out of six cases of seborrhoeic eczema gave excellent results. In acne the treatment proved very satisfactory, 12 cases showing better results than could have been obtained, in the writer's opinion, by the usual method. An average of 8 exposures was given, and improvement usually showed itself shortly after the fifth treatment. All types and grades were treated, and the most striking improvement was shown in the severer cases. He considers the roentgen ray as at present the most efficient agent in the treatment of acne. Rosacea did not prove responsive, whereas it was successful in a few cases of lichen planus. As was to be expected from previous experiences, sycosis and localized pruritus were successfully treated.

Toxicity of Salvarsan.—Schamberg[6] of Philadelphia and his associates, working in the Dermatological Research Laboratories of the Philadelphia Polyclinic and College for Graduates in Medicine, undertook studies with the view of shedding some additional light on the complex and important subject of the toxicity of salvarsan. These laboratory experiments, carried on chiefly by means of rabbits and rats, were of a high degree of interest, and gave cause for the following conclusions:

1. Salvarsan may be used in concentrated solutions up to 0.6 gms in 10cc. *in animals*, without any evident increase of toxicity.

2. The failure to neutralize the solutions of salvarsan with alkali leads to an increase in toxicity of 50-60% in solutions of 1-2 to 1% concentration.

3. The addition of a moderate excess of alkali beyond the amount required for neutralization does not increase the toxicity, as determinable by the duration of life of the experimental animal. It is possible, however, that it may have other untoward effects.

4. The use of sterile fresh distilled water appears to possess advantages over sterile stale distilled or non-distilled water, as regards toxicity, although the difference in our experiments was not pronounced.

5. Salvarsan in alkaline solution tends to undergo oxidation on standing, with consequent increased toxicity; but this substance and its congeners vary considerably in the rapidity of oxidation, and in the degree of associated tox-

icity. The drug should be used reasonably promptly after preparation. If two or three hours' delay is unavoidable, the solution should be kept in a cylinder, full to the stopper, so that no air is present.

6. Several different types of reactive symptoms may occur after the use of salvarsan: (a) immediate; (b) early, and (c) delayed. The immediate symptoms are due to a paresis of the blood vessels; the early symptoms coming in a few hours after the injections are febrile and gastronomical; and the delayed symptoms may be referable to the brain, or the liver and gastro-intestinal tract.

7. There is no one cause of reaction. The etiological factors in the production of reactive phenomena may be related to (a) the patient, (b) the technic, and (c) the medicament. We believe that the most important factor in the causation of reactions is referable to the drug. We believe that the immediate vasoparetic reactive symptoms are due to traces of an unidentified impurity in the drug, which we have for convenience termed substance X. We are confident that these symptoms are not due to "arsenoxide."

8. Salvarsan and its congeners are not compounds of absolute chemical purity. We cannot, therefore, expect absolute constancy in biological effects.

9. Salvarsan and its congeners may vary, within certain limits, in therapeutic effect, and to a greater degree in toxicity. The ampoules obtainable in the open market exhibit striking variations in toxicity.

10. Even the poorest compounds, however, are tolerated by animals in much higher amounts than the maximum dose administered to man, so that there is nearly always a latitude of safety.

11. We believe that the commercial products should be tested intravenously as well as subcutaneously, and that they should be tolerated by rabbits in the dose of 60 mg. per kilo of body weight.

12. Salvarsan is a safer substance than mercury and can be tolerated intravenously by white rats in 50 times the dose of the latter, weight for weight.

Radium in Lupus.—Paul Haslund, first assistant in Finsen's Light Institute in Copenhagen, was to have delivered a lecture on this subject before the Scandinavian Dermatological Society in June, 1916. This lecture was never given, owing to the author's death just before the meeting, but has been printed, as written, in the ***British Journal of Dermatology*** for October-December, 1916. He refers to the enthusiasm for treatment by radium that had passed over large parts of Europe four years previously, which was shown to be unfounded more than ten years after the introduction of radio-active substances into therapeutics. It was, however, the cause of the Finsen Institute purchasing a sufficient quantity of radium to enable them to make independent therapeutic observations. Although there has never been quite so high a degree of enthusiasm for radium in the treatment of lupus as in the case of malignant tumors, it has, nevertheless, been pronounced in some quarters. Danlos was the first to introduce this treatment in 1900, and the reports since then as to its value have been quite conflicting, and also as to the most effective way of administering it. Since it has been claimed that each apparatus has its peculiarities, that the power of resistance of the patient varies much, and that morbid tissues can stand much higher doses than healthy ones, Haslund considered that the whole system of treatment might be fairly termed at present a purely empirical one. In all, 31 cases of lupus vulgaris of the face were treated by radium as well as some with lupus of the mucous membranes. As to his results, he states that it is beyond doubt possible to obtain healing of the lupus foci, and consequently a permanent cure, in certain cases of limited extension, although even in this case one should be prepared for local relapses. In the majority of cases, however, the results were less favorable, for even if a definite improvement was shown in some cases, it was only after a long time, or was followed by retrogression or an absolute stand-still, so that it was thought necessary to substitute some other form of treatment. He considers that the cosmetic results are not so good after radium treatment as after the light and even x-ray treatment, owing to atrophy and telangiectasis that may ensue; and on the whole that the radium treatment is inferior to our other means of curing the disease.

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[3] British Journal of Derm. and Syphilis, April-June, 1917.
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Book Review.

Clinical Laboratory Technic for Nurses. By Anna L. Gibson, R.N. Boston: Whitcomb and Barrows, 1916.

This manual by the assistant superintendent of the Huntington Hospital is not only most creditable to the author, but affords a distinct addition to the nurse's education, covering, as it does, a hitherto unoccupied field. It is well known that as technicians women frequently excel men in the laboratory work which is here described; and the mastery of this department is a valuable asset to a trained nurse who desires to fit herself as the assistant of the practising physician or surgeon.

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ORGANIC LESIONS IN SHELL SHOCK.

RECENT observations on the various fronts tend to show that shell shock is the expression of a cell-exhaustion of the central nervous system. It is generally accepted by neurologists that this exhaustion is accompanied by pathological lesions of the cytoplasm. It is, perhaps, doubtful whether this change is invariable, and the laws governing it are still very imperfectly known, but, as a broad fact, it is certainly true. Such lesions may be divided into two main groups. First, those which are visible after proper staining of some particular cells or substance of the brain. These have been observed recently, and they seem to lie at the root of fatal cases of shell shock. Secondly, those which connote a diminished potentiality for the development of nerve force of such a nature as to impair the value of the cell. These are types of degeneracy which appear in spite of a satisfactory military training and environment. It is this latter class that alienists like Sir George Savage and Sir Robert Jones have described in the *Journal of Mental Science*. These authors seem to understand by the disposition to shell shock a marked falling away, mentally, morally, and physically, from the average condition of the soldier or race. Thus, among British soldiers, the habitual criminal and the morally perverse, the mentally unstable and insane, the physically weak and ill-developed are often spoken of as predisposed to shell shock. But there are also cases in which it occurs, in spite of hygienic surroundings, the best heredity, and the most careful education. It follows that shock or fear or the dread of the "unknown," of sufficient severity to overwhelm the will, may cause in healthy men the whole syndrome of the affection—the unconsciousness, aphasia, abasia, and pseudo-paraplegia. It is shown by Nissl and by Nonne that the power to resist the highest degree of fear, as in drumfire, explosion of mine craters, etc., necessitates the presence of the maximum nervous potentiality plus an optimum constitution. This is the meaning of Dr. Mott's phrase that many cases of shell shock are the neuro-potentially unfit.

There are three chief views as to the causation, which have been fully discussed by Wollenberg (*Archiv für Psychiatrie*, 1916, p. 335), and more recently by two Italian neurologists. Lattes and Goria (*Archivio di Antropologia Criminale*, April, 1917). The first is, that shell shock is not the expression of a pathological cell change, but the sign of a defect which exists in certain strains or stocks, and which most writers describe as psychoneurosis, hysteria, suggestibility, and degeneracy. On this view it is presumed that the innate nerve potentiality has been impaired by congenital or acquired hysteria and neurasthenia; it includes, besides, the types of degeneracy as seen in idiots, epileptics, and paranoiacs. In modern armies these groups are found, which obviously shows the importance of a minute family and individual history in the examination of soldiers. The second view is that the syndrome of shell shock is not the result of defects or atavistic causes, but arises of itself; in other words, it is psychogenic. Most writers agree that these cases—the functional, emotional, the hysterical in the usual sense—are the most numerous. As Wollenberg says: "In the bulk of the cases of shell shock (Granatkontusion) the emotional factor far outweighs the commotional." Dr. Mott and other British authorities take this view, but they have considerably narrowed the definition of hysteria.

The third classification is that the causes of shell shock—whether they have existed *ab initio* in the soldier's nervous system or whether they are psychogenic in origin—are physical processes, organic lesions, produced by the effects of long exposure to the gases, and other results of the bursting of powerful shells. In this place reference may be made to a recent work by Homburger (*Die körperlichen Erscheinungen der Kriegshysterie*). This author looks upon the question in a twofold way: either the idea of pure hysteria must be abandoned, or this form of hysteria must be sharply differentiated from hysteria with organic lesions. Most neurologists at the front find it exceedingly difficult to believe in traumatic hysteria (Oppenheim's) or molecular shock (Charcot's). Actual observers found that of 74 men examined after an artillery attack, 67 showed unmistakable signs of localized organic lesions of the central nervous system.

These lesions have now been studied post mortem by Dr. Mott and Captain Hurst. They, as well as French, Italian and Russian neurologists, have observed: (*a*) early generalized chromatolytic changes in the cells of the central nervous system, (*b*) disappearance of the basophile substances (*c*) extravasation of blood into the substance of the brain, (*d*) punctate hemorrhages with congestion of the meninges, (*e*) minute hemorrhages and changes due to the effects of compression and decompression, that is to say, as in caisson disease, with cerebrospinal fluid under high pressure, albumin, blood, and excess of lymphocytes. It has been noticed by several observers that the clinical signs are those of organic changes; and Homburger, Mörcher, and Nissl believe that the war has altered our conceptions of hysteria though it has produced no new type. Nissl, in particular, appears to question the existence of the "hysterical personality." Shell shock is that condition of nervousness which results from the exhaustion of the inherent vitality of the cells. They are unable to function because they have come to the end of their physiological banking account. In fact, to Nissl most cases are due to a completely human and normal weakness, and the organic lesions, it might be added, are equally likely to be due to the action of inorganic poisons, as gas, and physical agents, concussion and commotion.

PUBLIC HEALTH VALUE OF UNIVERSAL PHYSICAL EXAMINATIONS.

FROM time to time it has been urged that all individuals submit periodically to physical examination in order that disease may be detected and that in this way the standard of health of the community and of the people be raised. In justification of this most radical procedure, the claim that about 80% of the people are suffering from one form of disease or another is advanced. The large number of rejections for physical causes in the draft is also pointed to as an argument in favor of this examination. For this large percentage of sickness there is, however, no statistical or other foundation, even if all minor ailments to which man may temporarily be subject, be included. From the draft standpoint it must be remembered that most of the rejections were for physical inadaptability to this form of vocation,—the military vocation. This rejection in no wise reflects upon the general health or fitness for other useful or necessary vocations. And, indeed, the modern tendency is to reject no one except for tangible disease, but to fit everyone for even a military vocation which he is able to do. The time is past when the bogey of disease must be used upon intelligent individuals in order to force them to attend to ordinary health and sanitary precautions. The general health of the public does not depend so much upon individual endeavor to perfect one's own body as it does upon the health activity of a particular community in closing the large and patent avenues of danger to health, such as in respect to food, active contagion, dangerous industries, general sanitation, protection of the young, etc. When a community gives these matters the maximum attention of which it is capable there is little need of this sort of individual anticipatory attention to possible disease. That health is purchasable by a community is more than ever true.

Moreover, it is very much of a question whether it is advisable to increase the tendency in some people to hypochondria and other forms of physical introspection with these examinations, for the advantage that might be gained through the detection of disease not otherwise suspected. There is already too much attention paid to the purely physical, and too little to the mental, ethical and spiritual phases of life. A decent regard for the health, cleanliness and general well-being of the body is absolutely necessary, but to deify it or to make it the main consideration of life, with the fear for its safety that it engenders, is unworthy of the times. Besides, it is illogical to examine the body periodically without giving parallel attention to the mind, since they are very often dependent upon each other; yet to advocate the periodic examination of the mind of all people would appear absurd to those who advocate the examination of body. It is hoped that the periodic examinations would detect most cases of tuberculosis and thus prevent its spread. The few active cases not under surveillance would not be worth the trouble of detecting them.

Furthermore, these examinations would soon be looked upon as guarantees of good health made by the medical examiner, and contrary eventualities would react unfavorably upon the ability and integrity of the whole profession. It would defeat its own purpose because it would vitiate the value to the laity of future examinations. There is no doubt that in civilized communities most of the active cases of illness are being looked after. The occult cases or the cases that are rather potential than active, are very hard to detect, even when the individual presents himself for examination for cause. Diagnosis is not a question of examination and then diagnosis. For the good of all, the laity must be disabused of this false notion. Examinations on the scale proposed would tend the more to encourage this notion. The idea of periodic physical examinations of certain individuals or classes is, however, a good one. Frequent examinations of the inmates of institutions, schools, factories and the like by their own medical officers is valuable and feasible because of the community of interest in all the individuals concerned. From the same standpoint, the examination by life insurance companies of their policy holders is good. It is to their material interest that their insured maintain life and health. The value of these latter examinations lies particularly in the fact that they are made by medical officers concerned only with a particular class, but does not apply to the physician at large, who must be occupied with the tangible ills of a community. At the present time medical men will be scarcer and scarcer as they are needed for war work. Those remaining will be quite busy with more pressing needs, and will have little time to officiate in the medical examination arenas. It is much better to concentrate with the proper health authorities the supervision of the community's health and allow them to urge proper living as a means of conserving the health of the individual. Much as the propagandum for this sort of examination maintains to the contrary, the health and the well-being of the community and the individual are good. Statements to the contrary are libels, no matter what the source or the motive.

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EVERY DOCTOR IN THE MEDICAL RESERVE CORPS.

What an ideal situation it would be if every doctor in the United States who is mentally, physically and morally fit, were in this Corps. The time is coming, and in the immediate future, when the Medical Reserve Corps of the army must be immensely augmented; and to enable the Surgeon-General to have at his command for immediate assignment, as conditions demand, a sufficient number of trained medical officers, let us take the above thought seriously. We all know, from past history, the conserving value of an efficient medical corps, and this means number as well as training. A statement made by one high in authority in the Surgeon-General's office, "that our fighting forces would be disseminated by sickness and casualties in six months were it not for an efficient Army Medical Corps," clearly emphasizes the importance of every doctor in the United States, meeting the requirements above referred to, accepting a commission in the Medical Reserve Corps of the United States Army.

The struggle in which we are now engaged, and for which we are preparing to take such a prominent part, depends for its success as much upon the medical profession as it does upon our combatant forces, and while we do not know that any such intention as herein suggested is in the mind of the Surgeon-General, it would at least give him the necessary corps of medical officers upon which to draw, and thus serve the best interests of our country, and the best interests of the medical officer serving.

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Deaths among Troops in France.—On December 20, General Pershing reported four deaths among privates—one from measles, one from meningitis, and two from pneumonia.

MEDICAL NOTES.

PHOTOCHEMISTRY.—A prize of one hundred dollars is offered for the best research work upon photochemistry in its broadest aspect, done at the Harvard Medical School during the Academic year 1917-18. This prize is open to any research worker at the school. Papers submitted in competition must be in the hands of the committee not later than September 1, 1918, and should be forwarded to the chairman, Dr. Otto Folin, Harvard Medical School, Boston. The committee on the award consists of the head, or acting heads, of the departments of bio-chemistry, physiology and bacteriology of the Harvard Medical School. Papers must be typewritten, and should consist mainly of the results of unpublished original work.

HOSPITAL BEQUEST.—By the will of the late Mrs. Martha A. Cummings of Brookline, the Rhode Island Hospital at Providence is to receive a bequest of $8000; one-half of this sum is to establish a free bed, to be known as the Silas William Cummings bed, in memory of Mrs. Cummings' husband, and the other half to bear her own name.

WEEKLY REPORT OF HEALTH IN TRAINING CAMPS.—The report for the week ended December 14 showed that the health in camps of the National Guard divisions had improved, and that in the National Army camps had not improved.

Deaths for the week in the Guard division totalled 165, as against 190 the week previous, and those in the National Army 97, against 74 the week before. Of the Guardsmen dying, 143 succumbed to pneumonia and 12 to meningitis. In the National Army there were 69 deaths from pneumonia and 18 from meningitis.

There was a decrease of 128 cases of pneumonia in the Guard camps, the total for the week being 294, as against 423 the week previous. Cases of measles decreased from 2633 the previous week to 1058, and meningitis from 42 to 30.

In the National Army there was an increase of 124 cases of pneumonia, with 294 this week against 170 the week before. There were 2251 cases of measles this week, against 1369 the previous week, while meningitis cases were 61, against 35 last week.

MILITARY HOSPITAL IN BOSTON.—Under the direction of Lieut.-Col. William A. Brooks of the Massachusetts State Guard an emergency hospital of about 450 beds will be made to occupy the artillery drill shed of the Commonwealth Armory. The hospital will consist of twenty-two wards of twenty beds each, with a sterilizing plant, operating room and dressing stations. It will be under the supervision of the medical division of the Massachusetts State Guard, which will furnish the entire medical and surgical personnel of the staff, and will be available for use in the event of a disaster such as befell Halifax.

PROMOTION OF SURGEONS TO REAR ADMIRALS.—The President has selected Medical Directors George H. Barber and Edward R. Stitt to be promoted to the rank of rear admirals. Dr. Barber is a native of Massachusetts, and has been for several years director of the Naval Hospital at Las Animas, Col. Dr. Stitt is president of the Naval School, Washington, and an authority on tropical medicine.

WAR NOTES.

SANITARY CONDITIONS AT WAR CAMPS.—Surgeon-General Gorgas, in making his report of conditions at the army cantonments where epidemics are rife, stated that insufficient clothing, overcrowding and bad sanitary conditions are largely responsible for disease prevalence. With the exception of Camp Funston at Kansas none of the camp base hospitals have been completed, the work of the medical officers being thereby much handicapped.

"Gen. Gorgas recommends observation camps, the relieving of overcrowded conditions, the oiling of nearby roads to keep down the dust, and the erection and heating of ambulance sheds to obviate the present difficulties found in getting the motor ambulances started during the cold weather, because of the freezing of the water in the radiators.

At Camp Bowie, where the 36th Guard division is training, General Gorgas reported 41 deaths during the past month from pneumonia out of 409 cases admitted to the hospital. About 2900 cases of measles have developed in the same length of time.

At Camp Funston, in the 89th National Army division, there have been 43 deaths from pneumonia with 189 cases, 22 from meningitis with 70 cases.

'This indicates the most serious condition as far as infection from meningitis and pneumonia is concerned,' Gen. Gorgas says. 'As emphasizing the situation, I call attention to the fact that they had 84 deaths from all causes when the normal death rate of such a command should be about 12.'

The General reports that among the 36,000 drafted men injected in the cantonment in October were many meningitis carriers, this part of the country being known, he says, to all health officers as having been for several years the principal epidemic center in the civil population for meningitis.

Sanitary conditions at Camp Sevier, in the 13th Guard division, are described by General Gorgas as serious. Sixty men have died of pneumonia in the past month, and the camp has been exposed to a general epidemic of measles, about 2000 cases having occurred. During the month there have been 175 cases of pneumonia and 15 cases of meningitis.

The basic cause of unsanitary conditions, the report continues, is overcrowding as the result of the shortage of tentage. From 11 to 12 men had to be put into each tent with about 20 square feet to each man. General Gorgas recommends that no additional men be sent to this camp until the division commander says he is able to care for them in the proper manner.

During the past month at Camp Doniphan, where the 35th Guard division is training, there have been 74 admissions from pneumonia with 11 deaths; 316 cases of measles and 1 death; 104 of diphtheria with 1 death; and 6 of meningitis, with 4 deaths. Overcrowding is described by the report as the basic cause.

War Relief Funds.—On Dec. 30, the totals of the principal New England war relief funds reached the following amounts:

French Wounded Fund	$305,701.62
Armenian-Syrian Fund	273,741.33
French Orphanage Fund	136,246.34
Serbian Fund	125,725.42
Italian Fund	108,216.21
Polish Fund	94,682.73
LaFayette Fund	34,097.28
War Dogs' Fund	2,393.53

BOSTON AND MASSACHUSETTS.

Week's Death Rate in Boston.—During the week ending Dec. 22, 1917, the number of deaths reported was 235, against 239 last year, with a rate of 15.86, against 16.39 last year. There were 34 deaths under one year of age, against 35 last year.

The number of cases of principal reportable diseases were: diphtheria, 119; scarlet fever, 47; measles, 85; whooping cough, 42; typhoid fever, 3; tuberculosis, 48.

Included in the above were the following cases of non-residents: diphtheria, 10; scarlet fever, 7; measles, 2.

Total deaths from these diseases were: diphtheria, 5; measles, 2; whooping cough, 2; typhoid fever, 1; tuberculosis, 22.

Included in the above were the following non-residents: diphtheria, 1; measles, 1; tuberculosis, 1.

Boston City Hospital Contagious Wards.—At the opening of the new City Hospital West Department in West Roxbury, recently, Mr. Shuman, president of the Board of Trustees, gave the following interesting account of the development of the City Hospital in its care of contagious diseases.

"On Aug. 31, 1895, the South Department for communicable diseases was opened, marking a new era in hospital administration, as this was the first hospital for such diseases in this country. Before that time, scarlet fever, diphtheria and measles were admitted into general hospitals and more or less isolated in rooms and wards therein. The trustees of the hospital at that time recognized this as a very great menace to the hospital and to the community, although they had set aside two wards—old A and E—for that purpose.

During the 22 years that the South Department has been open very valuable work has been carried on here. The value of antitoxin was early recognized by Dr. McCollom, and he was the first man to use mammoth doses of antitoxin, now universally used throughout the world. The result of this treatment is shown by the fact that before the use of antitoxin the mortality from diphtheria was 48 per cent., and last year's record shows that it has been reduced to 7 per cent. Equally valuable has been Dr. Mallory's research work in scarlet fever, during which he discovered the bacillus.

Several years ago, during Mayor Fitzgerald's administration, the trustees realized that the South Department had outgrown itself, and requested an appropriation from the Mayor and City Council to build new wards on the corner of Harrison avenue and Northampton street. An appropriation of $298,000 was granted for this purpose. Later, when the Parental School was abolished, the City Government transferred the buildings and grounds thereof to the hospital department in connection with the South Department, and the above-named appropriation, to the amount of $200,000, was transferred to this new branch of the hospital, which is known as the West Department. The result is before you in the remodeling and connecting corridors of the different buildings, made suitable for hospital purposes.

For the past few years it has been necessary to request from the Health Department the use of the Southampton wards for the overflow of scarlet fever and diphtheria from the South Department. A short time ago the trustees, knowing that they were rapidly nearing the time when they would have to take care of the overflow, and because of the fact that several cases of smallpox were housed at the Southampton wards, realized that they must immediately open the diphtheria and whooping cough wards of the West Department. The rest of the buildings, it is hoped, will be ready for occupancy within the next two months. They would have been completed before now but for the delay incident to such alterations and building.

The West Department again marks a new era in hospital administration, for the ward that has been set aside solely for whooping cough is the first distinctly whooping cough ward opened in the country.

It is a source of pride and gratification that the city of Boston takes better care of its afflicted citizens than any other city in the United States. Its hospital doors are wide open at all times for all who are entitled to treatment therein. The City Government has always been generous and liberal toward its City Hospital and this has enabled the trustees to keep abreast with the times and put the institution on the plane of highest efficiency for the welfare of the people."

HOSPITAL BEQUEST.—By the will of the late Mrs. Dorcas C. True of Malden, Mass., the Malden Hospital receives a gift of $1000.

CITY HOSPITAL TRUSTEE.—Dr. John P. Toomey of Roxbury has been appointed trustee of the Boston City Hospital to fill the vacancy left by the recent death of Conrad J. Rueter. Dr. Toomey is a graduate of Harvard Medical School.

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Obituary.

PROFESSOR THEODOR KOCHER.

THE death of Professor Theodor Kocher in Berne, Switzerland, marked the end of a long and famous career of one of the pioneers of surgery. Professor Kocher was born in Berne on August 25, 1841, and after his student days there, spent some time in Berlin, London, Paris and Vienna, where he was a pupil of Billroth's. He graduated at Berne in 1865, was called to the chair of clinical surgery in the University of Berne in 1872, and for forty-five years was head of the university surgical clinic there. In a recent number of the *British Medical Journal*, Sir Berkeley Moynihan gives the following appreciation of Kocher's work and influence:

"With the death of Kocher the world loses its greatest surgeon. He lived a long life of unceasing industry, he covered a wider range of subjects than any living surgeon, and all his work was marked by clear insight, profound thought, accurate and well-ordered statement, and wise judgment.

From his earliest days he was a sound anatomist. The first of his contributions to surgery to attract attention was that in which he worked out the method now known by his name for the reduction of a dislocated shoulder. On one memorable occasion, when he sat among the audience in Billroth's theatre, a case of old unreduced subcoracoid dislocation of the shoulder was brought in. Every method of reduction was tried and failed, and efforts were at last abandoned, when Kocher, who had just perfected his own procedure, asked to be allowed to try it. Billroth consented and the shoulder was at once replaced. Kocher, being asked, went on to describe the usual position of the rent in the joint capsule, the direction of movement of the head of the humerus as it escaped from the joint, and the final positions in which it might lie. He then showed why the manipulations which he proposed were sure to succeed if duly carried out, in the ordinary case.

Throughout a long life Kocher's devotion to anatomy and his operative work on the cadaver were unceasing. There were few days, in summer or winter session, when he did not visit the post-mortem room to demonstrate an old operation or try a new one. His book on operative surgery gives plain evidence throughout of his easy familiarity with the anatomy of every part.

Quite early in his career he realized the truth and the vast scope of Lister's teaching. In 1875, or earlier, he introduced the operation for carcinoma of the tongue, in which, for the first time in an operation upon the mouth, a strict attention to antiseptic principles was made essential. In later years Kocher himself abandoned this method in advanced cases for that which generally bears the name of Syme. His freedom from prejudice for his own intellectual progeny was shown also in his frequent choice of other methods than his own for the radical cure of hernia. The method he devised was excellent, and indeed, when first introduced, was almost universally acclaimed as the best; yet many surgeons who visited him saw Bassini's method practised more often than his own.

Kocher's name throughout the world was perhaps chiefly associated with his work on the thyroid gland. His contributions to our knowledge of the diseases of this gland and their treatment are, of course, unrivalled, and he has probably left little or nothing for anyone else to say. His operations numbered many thousands, and as occasions for a scrupulous and minutely careful technical display they were unsurpassed; every tiniest detail was arranged, every difficulty most gently overcome; there was no haste, no untidiness, no shedding of one drop of blood that could be spared. Infinite accuracy, infinite care, infinite patience, gave him results as near to absolute perfection as it is possible for surgery to go. As one retraced, in afterthought, every stage in a difficult and tedious, and perhaps prolonged operation, it seemed impossible to find a fault or to discover where anything could go wrong. From the treatment of the simple cumbersome tumors of the thyroid he was led to the study of Graves' disease, and was the first to urge, and with increasing success to practise, the surgical treatment of this condition. No one who saw him operate in a case of severe Graves' disease would ever forget his tender care, his exquisitely gentle touch, and the deft, light movement of every finger. When everything was finished, the stainless towels round the wound failed to reveal the fact that an operation had taken place. Such an operation—indeed, every operation Kocher ever did—was a supreme exhibition of what perfect anatomical knowledge, a blameless aseptic conscience, the most practised technical efficiency, unfaltering courage, unruffled calm, and the most exquisite gentleness could accomplish. Many of the great surgeons of today will frankly admit that in all these things Kocher taught them more than any other man. He was a slow operator, but there was never a moment wasted. To do an operation as he thought it ought to be done, time was necessary. Those who were privileged to see his patients, in his private clinic or in the public hospital, will agree that no patient suffered from such an expenditure of time as Kocher found necessary. His whole work demonstrated the folly of those who operate with the single desire for speed. His method was the perfect one. He never wasted an instant; he never had to hurry; everything fell out according to plan, and the most sensitive tissue could hardly have been conscious of anything but a caress.

His literary work was amazing in quantity and in its high value. He published many years ago his work on diseases of the male generative system, which younger surgeons have too soon and too easily forgotten. His books on diseases of the spinal cord and on cerebral compression displayed his capacity for the most labored inquiry into the details of difficult problems or cases and for original experimental work of the highest order.

His work in almost any department of surgery would alone have made him a reputation as a surgeon of great gifts. He devised methods, whether entirely new, or wise, sound and timely modifications of older methods, with amazing fertility, for operations upon the lungs, the stomach, the gall-bladder, the intestine, upon hernia, upon cranial nerves, and so on. He invented instruments and appliances innumerable—tables, scissors, clips, clamps, screens, and towels. These were mere incidents in his daily work. Every artist must have the right instruments for his handicraft. Kocher's new methods, practised for new conditions, required new implements, and he was not slow to design them.

As a teacher he was greatly painstaking, diligent, and earnest. For two hours, 8 to 10 a.m., in the sessions he would teach in the theatre. Cases were brought in, examined and discussed. Some skill as an artist helped Kocher to make his teaching easy to acquire. He was never impatient with an honest, if stupid, effort; his voice grew high pitched and querulous when a student would try to deceive him with a clumsy bluff.

His life was one of unceasing activity. He began work early, teaching and operating at the hospital nearly every morning, and occupying the afternoons either in his private clinic, or in his study, going with great labor through the careful records of his cases.

What is the chief legacy a surgeon leaves behind him? Personal reputation, however exalted, is soon forgotten, and the name of a distinguished surgeon may not be long remembered even in his own country. Books which at the time of their appearance are striking in new thoughts, or in the fresh presentation of old ones, cease soon to be read. Even in the long survivors, new editions change not only their contents, but perhaps the title also. The spoken word, whether by the bedside or in the theatre, is apt to slip from the memory or to be imperfectly recalled. A few characteristic sayings may chance to be handed down, but their authorship is soon lost. Wealth is, of course, rarely attained by any member of our profession, and for itself has happily no value among us.

The chief legacy which a surgeon can bequeath is a gift of the spirit. To inspire many successors with a firm belief in the high destiny of our calling, and with a confident and unwavering intention both to search out the secrets of medicine in her innermost recesses, and to practise the knowledge so acquired with lofty purpose, high ideals and generous heart, for the benefit of humanity—that is the best that a man can transmit.

Though Kocher trained no great men in his own school, as Billroth did, there are surgeons all over the earth who can say that in larger or smaller measure it is their pride to claim some humble share in this great inheritance, which Kocher, above all others, has nobly bequeathed to them."

A more intimate account of Professor Kocher is given by Lieut.-Colonel Lynn Thomas, C.B., C.M.G.

"By the death of Professor Kocher, one of the outstanding modern masters of surgery has been removed. He was undoubtedly one of the great makers of surgery of the nineteenth and twentieth centuries. I had the great privilege of knowing him for over twenty years, and during a visit he paid Cardiff and South Wales I had the opportunity of realizing how many interests he had in life apart from that of surgery.

As a surgeon he was unsurpassed in the observance of detail in technic, and during the many visits I paid to his operation theatres at the Inselspital and his private hospital I never saw a single occasion upon which one could criticize adversely, or went away with a feeling that somebody else who had specialized in departmental work could have done the work he had in hand in a more masterly fashion. I have seen surgeons on the Continent and in America who could operate with more speed, but I have never seen one whose judgment was so sound in the performance of daring operations where risk to life arose. He had one speed, which I designated the 'Kocher speed': it was uniform whether he performed the simplest or the most complex operation, either upon the extremities, the abdomen, the neck, or the brain. There is hardly a branch of modern surgery in which he has not left a valuable and permanent impress, but his name will always be connected with a revolution in the treatment of goiters, and as an illustration of the amount of work he did in this department alone I may quote from a letter I received from his son, Albert Kocher, dated March 12, 1912, the following sentence, 'My father yesterday performed his fifth thousandth goiter operation.'

I have never seen him use spectacles for operations, and in talking this matter over he said that Nature had been very good to him in giving him two eyes, the one for the enthusiasm of early age, and the other for the maturity of vigorous but advancing years. He had an extraordinary energy for work, and I have seen him working from 8 o'clock in the morning until 1 o'clock at the Inselspital, then in the afternoon perform three thyroidectomies for Graves' disease (upon a Russian, a German, and an American) at his private hospital, and afterwards pay visits and hold consultations, and turn up at 8 o'clock in the evening to dinner without any appearance of fatigue. He had an old-world courtesy, and in his home circle was always affectionate, pleasant, and humorous. The last occasion on which I visited Berne was in June, 1914, and at that time he was as alert and as keen in his work as he was the first day I met him.

Surgery all over the world has lost a great figure by the death of Professor Kocher, and it is pleasant to record that in his own native town so dear to him and Mrs. Kocher, his genius was long ago recognized; one of its main streets is designated by his illustrious name."

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FRANK WENTWORTH PLUMMER, M.D.

DR. **FRANK WENTWORTH PLUMMER** died of erysipelas and broncho-pneumonia at his home in Malden, December 15, 1917, at the age of 47.

Dr. Plummer was born in Portsmouth, N. H., February 20, 1870, and was the son of Selwin B. and Sarah (Wentworth) Plummer. When he was three years old his parents removed to Charlestown, and soon afterward to Malden, where most of Dr. Plummer's life has been spent. He was a graduate of the Malden grammar and high schools and of Dartmouth with the class of 1891. He then went to the Harvard Medical School, where he was graduated in 1895, as he was from the Worcester City Hospital in 1896. Since that time he had been active in practice in Malden.

He had served there as chairman of the board of medical inspectors of the public schools, and he was a member of Converse Lodge of Masons and various branches of that order, as well as the Odd Fellows, the Malden Medical Society, Middlesex South District Medical Society, of which he was treasurer, and of the American Medical Association. He was a member of the Center Methodist Church.

On Feb. 12, 1903, Dr. Plummer married Deborah Allen Wiggin, daughter of the late Judge Wiggin of Malden. Dr. Plummer's wife and four children, two boys and two girls, survive him, as does a brother.

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CHARLES GREENLEAF CARLETON, M.D.

DR. **CHARLES GREENLEAF CARLETON** was born at Haverhill, November 1, 1843, and died at Lawrence, December 17, 1917, at the age of 74. He was a son of Colonel Samuel and Sarah (Clarke) Carleton, and studied medicine at the Harvard Medical School. He was at the school only a year when he enlisted as a medical cadet and subsequently was made an assistant surgeon in the army, serving in that capacity until the close of the Civil War. He then returned to the Harvard Medical School, and was graduated in the class of '67. He thereafter made his home in Lawrence.

Dr. Carleton had been for many years, and up to the time of his death, the president of the medical staff of the Lawrence General Hospital, was city physician in 1895-96, consulting physician at the Danvers Insane Hospital from 1881 to 1907, a member of the Massachusetts Medical Society, and president of the Essex North Medical Society in 1889 and 1890. One of his sons is Lieutenant Francis Coggswell Carleton of the United States Field Artillery, stationed at Camp Stanley, Texas. Recently Dr. Carleton had been active in arranging a patriotic meeting for the physicians of Lawrence. He was also a member of Needham Post, No. 39, G.A.R., and was chairman of the board of deacons of the Trinity Congregational Church, Lawrence.

In August of last year the physicians and surgeons of Lawrence and vicinity gave him a complimentary dinner on the completion of fifty years' active practice in Lawrence. He is survived by his widow and four children.

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FRANKLIN PAINE MALL, M.D.

THE recent death of DR. **FRANKLIN PAINE MALL** of Johns Hopkins University was a sad loss to anatomical science in this country. Dr. Mall was born in 1862 and received his degree of M.D. from the University of Michigan. The *British Medical Journal* pays the following tribute to his work:

"He performed two great works for the profession in the United States—he introduced new methods of teaching anatomy, and he created a school which has had, through its pupils, a widespread influence. The opening of his laboratory at the Johns Hopkins University in 1893 marks the beginning of an era for the subject in the medical schools of America. Bowditch in Boston, and Newell Martin in Baltimore, with wellequipped laboratories and new methods, had laid the foundation of the modern and flourishing American school of physiology, but anatomy was still a handmaid of surgery and of medicine, and taught in old-time dissecting rooms and in the old way. Mall changed this and made the anatomical laboratory of the medical school a workshop for teaching, training, and investigation. With the true Hunterian spirit he had little faith in lectures, but immense faith in steady, continuous concentration in practical work. 'The aim,' as he said, 'is to make the course one continuous problem for each student to investigate, aiding each one with good material, and teaching him how to study.' More stress was laid on origin and function than on the acquisition of the dry details of anatomy. The experimental, investigating spirit was too strong in the laboratory to allow any but the weakest men to worry over the minutiae, and a man's examination was largely the weekly report on the character of his work. Inferior students were mercilessly asked to go elsewhere. The best men in the school were attracted to Mall by the quiet helpful way in which they were taught how to work. His own investigations cover a wide field, and with an unequalled technic for modelling and reconstruction his papers were works of art. The *American Journal of Anatomy*, the *Anatomical Record*, and the *Journal of Morphology* testify to the zeal and ability of his pupils. To few men is it given to revolutionize completely the method of teaching and investigating a subject. This Mall did for anatomy in the United States."

Miscellany.

FREE PUBLIC LECTURES ON MEDICAL SUBJECTS.

THE Faculty of Medicine of Harvard University offers a course of free public lectures on medical subjects to be given at the Medical School, Longwood Avenue, Boston, on Sunday afternoons, beginning January 6 and ending April 21, 1918. The lectures will begin at four o'clock and the doors will be closed at five minutes past the hour. No tickets are required.

Jan.	6.	Dr. William F. Snow, Major, Med. Reserve Corps, U. S. A., "Social Hygiene and War."
Jan.	13.	Dr. W. T. Porter, "Surgical Shock."
Jan.	20.	Dr. G. H. Wright, "Teeth and Their Relation to Human Ailments; A Plea for Conservation."
Jan.	27.	Miss Elizabeth Sullivan, "Home Nursing," with demonstrations.
Feb.	3.	Dr. Richard M. Smith, "Child Welfare During the War."
Feb.	10.	Miss Mary Beard, "Child Welfare."
Feb.	17.	Dr. E. H. Bradford, "Shoes and Structure of the Foot."
Feb.	24.	Bishop Lawrence, "Social Infection and the Community."
March	3.	Dr. L. W. Baker, "The Deformed Mouth of a Child; its Effect on the Child's Future."
March	10.	Dr. L. J. Henderson, "Food: How to Save It."
March	17.	Dr. F. W. White, "What to Eat during War."
March	24.	Dr. Percy G. Stiles, "Some Aspects of Fatigue."
March	31.	Dr. Glenn I. Jones, Major, Med. Corps, U. S. A., "Camp Sanitation and Control, and Hospital Administration at Camp Devens."
April	7.	Dr. J. Bapst Blake, "Accidents and Injury. First-Aid" (with simple demonstrations).
April	14.	Dr. E. H. Place, "Immunity to Contagious Disease."
April	21.	Dr. I. Chandler Walker, "Hay Fever and Asthma."
April	28.	Dr. Julius Levy (under The National Food Committee), "Food Administration during the War."

Copies of this announcement and further information in regard to any of the lectures may be obtained by addressing The Chairman of the Committee on Public Lectures, The Harvard Medical School, 240 Longwood Avenue, Boston, Mass.

SOCIETY NOTICE.

THE MASSACHUSETTS SOCIETY OF EXAMINING PHYSICIANS—A meeting will be held at the Copley-Plaza Hotel on Jan. 3, 1918.

SUBJECTS

Medical Administration of Workmen's Compensation Insurance. Dr. George E. Tucker of California National Industrial Board.

Emergency Hospital Exemplified by the Halifax Disaster. Dr. Harold Giddings of Boston.

Dinner at 6.30.

Members of the profession cordially invited.

J. H. STEVENS, *Secretary*.

NOTICES.

MASSACHUSETTS SOCIETY FOR MENTAL HYGIENE.—Annual Conference to be held at Lorimer Hall (Tremont Temple) Boston, Wednesday, Jan. 9, 1918.

Afternoon Session, 3 P.M.—MENTAL HYGIENE AND THE WAR. (1) Nervous and Mental Breakdown from War Strain and Shock, Capt. John T. MacCurdy, M.O.R.C., New York; (2) What Canada is Doing for her Soldiers who Return with "Shell Shock," Dr. F. H. Sexton, Vocational Officer, Military Hospitals Commission, Canada; (3) What this Country is Doing to Keep from its Armies the Nervously and Mentally Unfit and Adequately to Care for those who become Disabled by the Shocks and Strains of War, Dr. Frankwood E. Williams, Associate Medical Director, National Committee for Mental Hygiene, New York City. (Moving pictures of groups of "Shell Shock" cases will be shown.)

Evening Session, 8 P.M.—THE DEFECTIVE DELINQUENT. (1) The Relation of Mental Defect and Disorders to Delinquency, Dr. Victor V. Anderson, Medical Director, Medical Service of the Municipal Court, Boston, Dr. William Healey, Director, Judge Baker Foundation, Boston; (2) The Defective Dlinquent in Court, Justice Frederick P. Cabot, Juvenile Court, Boston; (3) The Probation Problem of the Defective Delinquent, Herbert C. Parsons, Deputy Commissioner of Probation, Boston; (4) What Shall be done with the Defective Delinquent in the Penal Institutions? Col. Cyrus B. Adams, Director of Prisons, Boston. Mrs. Jessie D. Hodder, Superintendent, Reformatory for Women, Sherborn; (5) What Should be the Attitude of the Alienist toward the Defective Delinquent? Dr. George M. Kline, Director, Commission on Mental Diseases, Boston; (6) A Practical Program for Dealing with the Defective Delinquent, Representative B. L. Young, Weston.

BOSTON MEDICAL LIBRARY.—The Annual Meeting of the Boston Medical Library will be held in Sprague Hall on Tuesday, Jan. 8, 1918, at 8.15 P.M. Dr. E. A. Crockett will give a talk entitled "Observations of a Red Cross Officer in Europe."

WALTER L. BURRAGE, M.D., *Secretary*.